



# POSTGRADUATE MEDICINE

OFFICIAL JOURNAL OF THE INTERSTATE POSTGRADUATE MEDICAL ASSOCIATION OF NORTH AMERICA

JULY, 1947

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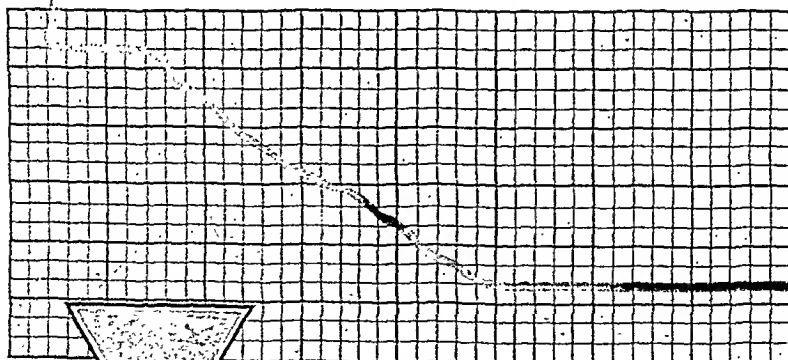
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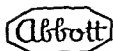
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# The Painful Shoulder

RALPH K. GHORMLEY\*

UNIVERSITY OF MINNESOTA GRADUATE SCHOOL OF MEDICINE, ROCHESTER, MINN.

IT IS UNDOUBTEDLY true that when one compares our knowledge of the problem of pain in the shoulder and the arm to knowledge of the problem of sciatic pain, it will be seen that there has been a comparatively small amount of work and writing on the shoulder in the past few years. Perhaps the subject of sciatic pain has been overemphasized, but out of all the many papers written on that subject has certainly come an improved knowledge of sciatic pain. Probably more thought needs to be given to the problem of the lame shoulder, and because of the frequent association of this condition with the problem of pain in the arms and neck, it becomes even more complicated than the problem of sciatic pain.

The anatomic aspects of the shoulder girdle and arm are extremely complex, and knowledge on this subject is not yet complete. The relationship of the anatomy to evolutionary changes cannot be overlooked, and the functional components of all the parts of the arm and shoulder girdle are certainly not thoroughly understood. Much has been learned about

them, but because of the complexity of the anatomy and physiology much more remains to be learned. It is not our purpose herein to elaborate on problems in the anatomy or physiology of the shoulder, but to discuss the more common problems of lesions of the shoulder which cause pain, and the differential diagnosis and treatment of such lesions. But we cannot forget that the very complexity of the shoulder mechanism makes these problems in themselves peculiar to the region in question.

Anyone interested in lesions of the shoulder and a broad discussion of the whole subject should read Codman's *The Shoulder*.<sup>1</sup> Careful study of the problems related by Codman to this structure brought out two important facts: (1) recognition of the lesion of torn infraspinatus tendon, and (2) the relationship of degeneration of the supraspinatus tendon to calcified deposits in the subdeltoid bursa.

In a more practical way the painful shoulder must be discussed from the standpoint of lesions of the shoulder alone and from the standpoint of lesions associated with pain in the arm or cervical portion of the spinal column. Sometimes the differential diagnosis may be difficult, but for a proper approach to therapy, a correct diagnosis is desirable. One must always remember that in addition to the shoulder joint

\*Section on Orthopedic Surgery, Mayo Clinic; Professor of Orthopedic Surgery, University of Minnesota Graduate School of Medicine, Rochester, Minnesota.

NOTE: Read before the meeting of the Interstate Postgraduate Medical Association of North America, Cleveland, Ohio, October 15 to 18, 1946.



RALPH K. GHORMLEY

The acromioclavicular joint is likewise a part of the shoulder girdle and may at times give rise to much discomfort. Lesions of this joint will be discussed later.

The most common lesions of the shoulder joint itself are not those of an arthritic nature. Fairly extensive damage to the articular surfaces of the head of the humerus and glenoid may occur without causing serious discomfort or annoyance. In this respect, the shoulder differs from the hip joint, which is, of course, mainly a weight-bearing joint, and for that reason the lesions of the weight-bearing articular surfaces are the main points of trouble in the hip. Since the shoulder joint, on the other hand, is not a weight-bearing joint, the lesions of the capsular structures and musculotendinous cuff are the important ones from a practical clinical standpoint. When these are excluded, many of the common causes of shoulder pain are absent.

"FROZEN SHOULDER," "PERIARTHRITIS,"  
"TENDINITIS"

*Diagnosis*—This condition constitutes one of the most common and most troublesome lesions causing painful shoulder, and because of the variable amount of limitation of motion of the shoulder, the lesion is one of the most disabling. Its etiology is frequently obscure. Its onset is usually rather insidious, with moderately severe pain. Sometimes, the onset is sudden and is accompanied by severe pain. Also, usually, the patient, either on the advice of a physician or because of his own intuition, keeps the shoulder fixed over a period of several days, during which time the symptoms may abate to some extent, but then the patient finds that movement has become restricted and that attempted forcing of the movements brings on severe pain. The variable type of onset probably is due to the fact that a variable type of inflammation initiates the condition. There is no definite knowledge as to just which structures are involved. Codman<sup>1</sup> called the underlying condition "tendinitis" but said, "It would require greater knowledge than is at the present time available to separate it pathologically from arthritis, bursitis, calcified deposits or from 'rim rents' of the supraspinatus." Lippmann<sup>2</sup> wrote that the common cause of frozen shoulder or periarthritis is inflammation in the sheath of the tendon of the long head of the biceps. Others have ascribed the lesion to other particular parts of the capsule or musculotendinous cuff.

The likely sequence of events leading to a frozen shoulder is inflammation in some portion of the musculotendinous cuff or capsule which is painful and which leads the patient to restrict motion of the shoulder. Spread of the process to the margin of the joint causes adhesions to form which produce greater restriction of motion. When motion is forced, pain is exacerbated and further restriction by the patient is likely until the limitation of motion becomes the more striking feature of the clinical picture. Once restriction of motion has been established, any effort at increasing the move-

ment causes pain and a vicious circle is established. The typical frozen-shoulder syndrome is a lesion of middle or late adult life.

ALTHOUGH THE more common frozen-shoulder syndrome is not usually a part of a generalized arthritis, it may occur in such cases, and is often found as a complication in any condition requiring prolonged fixation of the shoulder joints. In such conditions as fracture of the humerus or forearm with prolonged fixation, postoperative treatment in which the shoulder may be fixed for a long time, and in some cases of prolonged illness such as cardiac disease, a frozen shoulder will develop unless care has been taken to see that the shoulder is moved frequently during the convalescence.

Pain may be constant; it is always exacerbated on activity. Extension of pain down the arm may be of variable degree, and often is increased as the lesion becomes more nearly permanently established. Extension to the region of the insertion of the deltoid muscle to the humerus is not uncommon. Pain over the suprascapular area and along the trapezius muscle is fairly common. This, again, depends to some extent on the severity of the condition and the amount of protective muscular effort the patient may be consciously or unconsciously exerting. Swelling and local heat are symptoms not commonly noted.

On examination, the physician as a rule finds a patient in a variable degree of distress, carrying the arm with the elbow at the side and oftentimes supporting the forearm and elbow with a sling or the opposite hand. On both inspection and palpation, there may be evident some degree of atrophy of the shoulder muscles, depending on the duration and severity of the symptoms. Tenderness is not sharply or constantly localized, but is usually found around the attachment of the capsule to the head of the humerus. In some instances, it may be more marked along the bicipital groove and in others over the area of the subacromial

bursa. The most constant and definite observation is marked restriction in the movements of the shoulder joint. In the testing of these movements the physician must be careful to distinguish between scapulohumeral movement and movement of the entire shoulder girdle. The examiner can determine the amount of scapulohumeral movement by grasping the scapular angle and holding it with one hand while with the other hand he grasps the humerus and determines the range of its movement. In the frozen shoulder, movements are limited in all directions: when the condition is more severe, this limitation reaches an almost complete stage, whereas when it is milder, the limitation is less marked. Bony ankylosis does not occur.

An important aid in the diagnosis is the roentgenogram. Usually, the roentgenogram will disclose nothing in the earlier stages, but as time goes on, a variable amount of osteoporosis may be noted, in both the head and the neck of the humerus and in the scapular neck. It is important to look carefully for other lesions in the bones in order to exclude any possible complicating factor. Changes in the capsule, such as calcification of the subdeltoid bursa or peritendinous calcification, are seldom seen in the typical case of frozen shoulder, although frozen shoulder may complicate these lesions.

It is very important, however, to note the amount of osteoporosis that is present. In cases in which an extreme degree of osteoporosis is found, the physician should be very careful in any attempts at manipulation therapy, because of the danger of producing pathologic fracture.

*Treatment*—The treatment of this condition varies according to the stage of development of the lesion. In the earlier stages, manifested by local pain and limitation of motion, various forms of heat applied locally may be helpful, although it has been found that light doses of roentgen rays are about as effective as any treatment. As a rule, the patient should be persuaded to continue use of the arm as much as he can, in order to avoid the fixation and adhesions which are bound to follow when the

shoulder is given a prolonged rest. Hot packs, diathermy, or radiant heat may be used with somewhat less effective results. Injections of procaine hydrochloride may help to relieve acute pain and promote early motion. Aspirin is often useful to control pain, but codeine or even stronger sedative agents may be necessary when the condition is more acute and severe. At times, the shoulder must be put at rest by means of a sling or an airplane splint and in an occasional case, when the condition is very severe, rest in bed with traction may be necessary to relieve the patient in the more acute phases of the condition. As the pain subsides, if motion has been stopped, it should be resumed and graduated as fast as the patient can induce it in order to hasten the return of function. In my experience, until there has been a return of motion to its full range, some pain will remain; so that restoration of the joint motion is a most important part of the treatment.

When the condition is subacute or milder or when there is only a moderate degree of limitation of motion, physiotherapy with active and passive exercises may restore motion to normal and entirely relieve the condition. When the condition is more advanced, and when there is marked limitation of motion, I have found that a much more rapid recovery will take place if the shoulder is manipulated with the patient under the influence of anesthesia and if a full range of motion is obtained. As a rule after injection of the suprascapular nerve with procaine hydrochloride, pentothal sodium anesthesia is used. As soon as the patient becomes relaxed, the physician grasps the arm close up toward the shoulder joint with one hand and with the other hand, holds the scapula, and then applies firm upward pressure on the humerus. The physician must be careful not to force the patient's arm too vigorously or to grasp the arm close to the elbow, because the force exerted on the humerus with long leverage may cause fracture. As the shoulder is manipulated in this way, adhesions are felt to break, and after this a full range of motion usually can be carried out. If full range is not

accomplished, manipulation may be repeated in a few days. In some instances, it may be necessary to force an additional rotary motion in order to regain the full range of movement. Rotary force must be exerted carefully because of the danger of fracturing the neck of the humerus.

Immediately after manipulation, four things must be done. First, when the patient is returned to his bed, the arm should be tied to the head of the bed, so that a position of extreme abduction and external rotation is maintained. Second, roentgenograms should be made so that it can be certain that no damage has been done. Third, ice caps should be applied to the patient's shoulder to minimize the amount of swelling. Fourth, a physiotherapist, or an assistant, or the surgeon should see the patient as soon as he has recovered from anesthesia, and should put the patient's arm through a full range of movement. Such a procedure will assure the patient that it can be done, and will encourage more active effort on his part to continue active movement of the joint. Daily or twice daily treatment by the physiotherapist should be continued for several days until the patient can actively perform a normal or nearly normal range of movement, and the patient should be encouraged to continue such exercises until a full range of movement is obtained.

#### SUBDELTOID BURSITIS

*Diagnosis*—This entity usually is clear-cut when a definitely calcified bursa is present, but in the absence of calcification, the diagnosis may be difficult to make and the condition often confused with an early stage of periarthritis or tendinitis. Location of the lesion is fairly constant. The extent, shape and size of the bursa, however, are markedly variable. According to Codman,<sup>1</sup> "The subacromial bursa, the subdeltoid bursa, and the subcoracoid bursa are one and the same thing, although films of tissue may separate them."

In the most characteristic picture of subdeltoid bursitis, the patient is usually in his middle

years, and notices pain on certain movements of the shoulder joint, particularly on internal rotation and perhaps extreme external rotation. There may be attacks of much more severe pain, and during such attacks, movements of the shoulder are much more sharply limited, oftentimes severely disabling. It is usually during or after such an attack that a physician is called, and after roentgenologic examination is carried out, a diagnosis of calcified subdeltoid bursitis is made.

In the severe attacks examination usually reveals marked limitation of movement, with extreme tenderness over the area of the bursa and, at times, some degree of palpable and visible swelling in this region, particularly in slender persons. Movements, active and passive, are greatly limited. Pain at times may extend to the arm and even to the forearm, a phenomenon which has never been adequately explained. One explanation that I have felt plausible is that when severe pain occurs, pronounced spasm of the scapular muscles and muscles of the neck is set up and a secondary scalenus anticus syndrome results.

The demonstration of calcification in the area of the bursa at roentgenologic examination usually confirms the diagnosis, although it should be noted that fairly extensive calcification of a bursa may occur without production of any symptoms at all. Often, a minimal amount of such calcification develops in cases in which degeneration of the supraspinatus tendon has occurred and some of the calcareous material has escaped into the bursa. In most cases, when a typical syndrome of bursitis exists, a more extensive deposit of calcareous material is found in the bursa.

**Treatment**—Numerous forms of treatment have been advocated for this condition. The very fact that numerous treatments have been proposed probably shows that none is by any means perfect. There are actually two stages at which treatment can be administered: (1) the chronic stage, and (2) the stage of acute flare-up. So far as the calcification is concerned, it must be remembered that calcification may disappear without any treatment whatever.

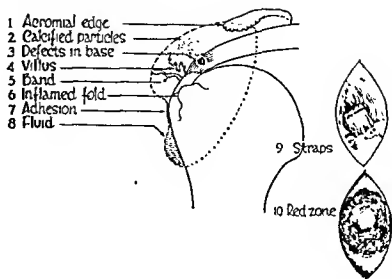


Figure 1. Important parts of the pathology of calcified bursitis. Note the degeneration of the tendon, with particles collecting in the bursal sac. (Reproduced, with permission, from Codman, E. A.: "The Shoulder," p. 68. Boston, published by the author, 1934).

In the treatment of the chronic stage, where calcification is present, efforts generally are directed toward stimulation of absorption of the calcified mass, since it is generally felt that with disappearance of the calcified area, the symptoms will subside.

AT THE Mayo Clinic it is our plan to inject the area of calcified mass or bursa with procaine hydrochloride. We first use a short needle. A skin bleb is raised over the region of the bursa, and through this area the bursa is reached. With a 50-mm. needle, about 20 cc. of a 1 per cent solution of procaine hydrochloride is injected into the area of the bursa; the position of the point of the needle is changed frequently so that the entire area of the bursa is anesthetized. With the same needle, numerous punctures of the bursa are made. Often, the calcification can be felt by the grating sensation produced when the tip of the needle encounters the calcification. Aspiration of the bursa contents is advocated by some. If a larger bore needle is used, the contents of the bursa can be partially removed in some cases. In my experience, however, complete removal of all of this material has been difficult in most cases.

Indeed, it is my feeling that complete removal is not necessary, because most of the material will be absorbed after thorough "needling" of the mass.

After the injection procedure, the patient is encouraged to move the shoulder through as free a range of movement as is possible. The day after the procedure is carried out, physiotherapy is commenced. It is my experience that the best form of physiotherapy is the old-fashioned "plate" or conventional diathermy. This seems to relieve the pain much more satisfactorily than the more modern "short-wave" type. With the diathermy light massage should be given, and the passive and active movements carried out to maintain a normal range of movement. In cases of frozen shoulder manipulation may also be necessary. For patients who do not show any improvement within a week or ten days, the injection procedure may be repeated.

FOR patients who experience an acute flare-up of pain in an old bursitis, the same procedure may be carried out. The injection of procaine hydrochloride often will bring prompt relief from pain, and although this effect is of short duration, it is encouraging to the patient. The conventional diathermy treatment often will help to relieve the pain and to hasten recovery.

For the more acute phases of the condition, roentgen therapy may be employed. This type of treatment has often relieved such episodes, and it has given considerable permanent relief in some cases. Calcified masses may disappear after this form of treatment, but it must be remembered that at times they may also disappear without any treatment.

In an occasional case in which pain is very severe, it may be necessary to have the patient go to a hospital. The patient's arm may be placed on an airplane splint or in traction with the maintenance of slight abduction to keep it in a position of maximal comfort. Sedative agents such as codeine and morphine sulfate may be necessary in an occasional case.

Occasionally, if the conservative types of treatment do not relieve the condition, excision of the calcified mass may be necessary. It should be noted that the mass may become ossified; in such instances conservative therapy will not help, and excision becomes necessary.

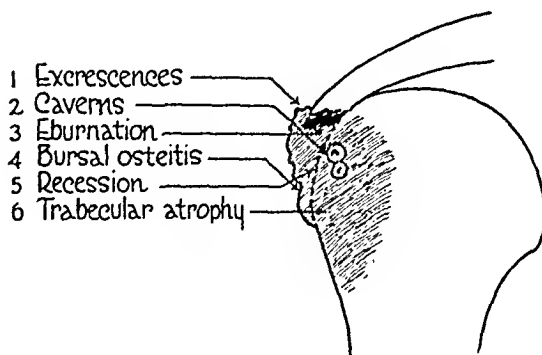


Figure 2. Diagrammatic representation of the changes in rupture of the supraspinatus tendon. (Reproduced, with permission, from Codman, E. A.: "The Shoulder," p. 91. Boston, published by the author, 1934).

#### TORN SUPRASPINATUS TENDON

Codman<sup>3</sup> again must be credited with bringing this lesion to the attention of the medical profession. His accurate description of the pathologic aspects and the sequence of events leading to the condition was given to us as early as 1911, but the profession, being slow to accept the idea, did not generally recognize the lesion until the past decade. In Codman's book, already referred to, he named partial and complete rupture of the supraspinatus tendon as the cause of half of the painful shoulders encountered, excluding such obvious diagnoses as tumors, fractures, and dislocations. He indicated that in a quarter of such cases partial rupture of the supraspinatus tendon has occurred, that in 15 per cent of cases the patients are women, and that the average age of a patient is forty-nine years. Complete ruptures, on the other hand, would be found in another quarter of such cases; in these the average age of the patient is fifty-five years, and 8 per cent are women.

To appreciate the significance of the frequency of occurrence of the lesion, the fact must be accepted that in a great many cases partial degeneration of the supraspinatus tendon takes place as part of the senescent process. Codman<sup>1</sup> said that "we do not know what the first step in the retrograde process is. It may be traumatic infarction, or perhaps due to a general toxic condition." Codman's observations, which were made on cadavers as well as on living human beings, have been substantiated by others, so that they are now generally accepted as valid.

**I**N OUR experience at the clinic, this condition usually is found among middle-aged or older persons who, after some mild or severe strain of the shoulder, felt a pain in the area of the supraspinatus attachment. This pain usually is increased on movement of the shoulder, particularly on abduction. The pain is not severe, as a rule, but is annoying and fairly constant. According to Codman, in a typical case there are eighteen conditions to be fulfilled in the making of a diagnosis. These are as follows: The patient is a laborer, more than forty years old who had no symptoms prior to the accident; he sustained an injury, usually a fall, with immediate sharp, brief pain, and more severe pain the next night; loss of power of elevation of the arm occurred; the roentgenogram disclosed nothing abnormal; there was little, if any, restriction when the patient was stooping; there were faulty scapulohumeral rhythm, a tender point, a sulcus, an eminence at the insertion of the supraspinatus which caused the patient to wince, and soft crepitus as the tuberosity disappeared under the acromion, and usually, also as it reappeared during the descent of the patient's arm.

In our experience, it is difficult to be sure of the diagnosis when the condition is milder. In the presence of more extensive tears of the musculotendinous cuff, the disability is greater and more persistent. Milder degrees of tears, although they undoubtedly exist and can be

diagnosed at the time of injury, may heal spontaneously and leave little or no disability. This is particularly true if they are treated in an abduction splint for a period of two or three weeks immediately after the injury.

When the condition is chronic, weakness may or may not be found on abduction, particularly at initiation of the abduction movement. A tender spot at the insertion of the supraspinatus tendon usually is found. An almost constant observation is the soft crepitus noticed beneath the acromion on passive abduction of the humerus.

In more extensive tears at the musculotendinous cuff, the most definite finding is the patient's inability to abduct the arm actively. This must be distinguished from inability to abduct the arm actively in cases of frozen shoulder. In tears of the musculotendinous cuff, active abduction is limited, whereas in frozen shoulder, both active abduction and passive abduction are limited. Distinction from injuries to the axillary nerve must be made. When this nerve has been injured, atrophy of the deltoid muscle is severe and there is usually a well-defined area of anesthesia.

The treatment of extensive tears of the musculotendinous cuff is surgical. In some cases plastic repair of the cuff can be accomplished by fascial transplants and sutures. When the tear is more severe, arthrodesis may be necessary to obtain relief from symptoms.

#### TENOSYNOVITIS

I have already indicated that in the early stages of the group of conditions called "frozen shoulder," tenosynovitis may be an important part of the underlying pathologic process. In some instances it is possible to identify such a lesion. Pain along the region of the bicipital groove and marked tenderness on pressure along the groove, together with pain on external rotation of the head of the humerus, are noted in these cases. Rest generally brings relief from pain that is caused by inflammation of the tendon or its sheath. Other tendons may



be the sites of inflammation, but none are so discrete and vulnerable as the long head of the biceps. Tenderness over the tip of the coracoid process at times may be the only definite finding at examination. A diagnosis of localized inflammation of the attachment of the coracobrachialis muscle and short head of the biceps may be made.

#### THE ACROMIOCLAVICULAR JOINT

*Diagnosis*—Two lesions of this joint are worth noting as causes of shoulder pain: (1) separation of the acromioclavicular joint, and (2) arthritis of the acromioclavicular joint.

Separation of the acromioclavicular joint is, as a rule, the result of injury, although an occasional patient may be seen whose condition has arisen without injury, apparently the result of congenital relaxation of the acromioclavicular ligaments. The condition generally is easily recognized; tenderness is localized to the region of the acromioclavicular joint and definite relaxation of the joint is demonstrated by pressure on the acromial end of the clavicle. When the condition is acute, there may be additional evidence of injury manifested by local swelling and limitation of the ability of the patient to abduct the arm actively. When it is chronic, the symptoms are variable; sometimes only the prominence at the outer end of the clavicle is noted, whereas in other instances pain and some loss of the patient's ability to abduct the arm are noted.

*Treatment*—When the condition is acute, treatment should consist of fixation by means of adhesive strapping passed over the shoulder and around the flexed elbow, with a pad over the outer end of the clavicle to retain its position. In my experience, such a retention strap must be applied very carefully and retained for a long time in order to be sure of healing without some degree of subluxation. Others have advocated the use of various types of internal fixation in acute forms of this condition.

For patients who have chronic dislocations of the acromioclavicular joint, with a minimal

amount of symptoms, it is doubtful if any treatment is indicated. For those who complain of pain and lessened function, surgical repair should be attempted. It is not my intention here to discuss the various methods of surgical repair in use. In many cases it is necessary to repair the coracoclavicular ligaments as well as the acromioclavicular ligaments.

Definite arthritis of this joint is seen fairly frequently. Such a lesion is manifested by pain usually localized to the area of the acromioclavicular joint, and this pain is aggravated by movements of the shoulder girdle. Hypertrophic changes may be visible in the roentgenogram. Rest, with applications of heat in the form of either hot packs or radiant heat, generally relieves the acute painful episodes, although the condition often may be chronic and pain may recur. Light doses of roentgen rays may be helpful.

#### OTHER CONDITIONS CAUSING PAINFUL SHOULDER

Many other conditions may be found less frequently to be causative factors of pain in the shoulder. Tumors of the head of the humerus and of the scapula as well as of the soft parts must be considered, as must old fractures with traumatic changes about the shoulder joint, acute fractures and any fracture dislocations. Fractures of the greater tuberosity of the humerus may be unrecognized and cause pain in the shoulder when not properly treated. Rheumatoid arthritis, tuberculosis, and other inflammatory lesions must be considered. I have seen several patients with paralysis of the scapular group of muscles whose main complaint was vague pain in the region of the shoulder girdle. This is particularly true of paralysis of the trapezius muscle after injuries to the spinal accessory nerve and in cases of paralysis of the serratus anterior muscle caused by injury of the long thoracic nerve (Bell). Postural strains and occupational strains may be, fairly frequently, the cause of pain in the shoulder. Such strains are seen where the patient's arm is carried at an awkward angle because of some deformity of the elbow. One of

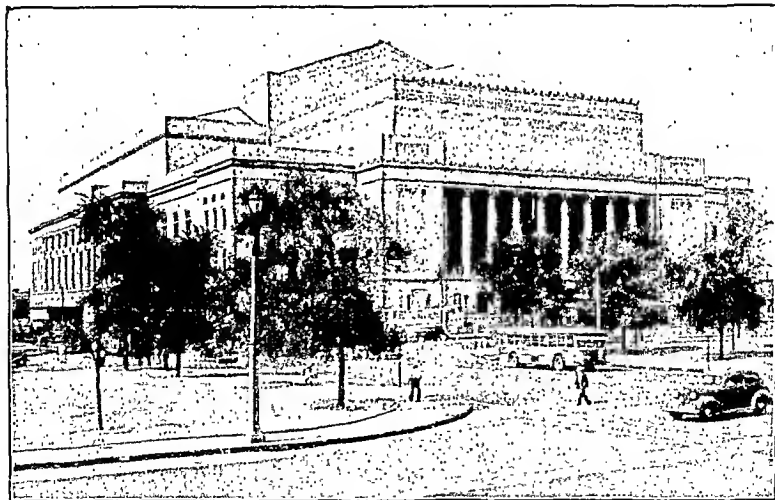
the most common symptoms of the complex known as "fibrositis" is pain in the suprascapular portion of the trapezius muscle. Expansion of such a lesion along the muscles of the shoulder girdle toward the shoulder joint may be a common cause of pain in the shoulder.

I have only briefly touched on the relationship between shoulder pain and arm pain and their relationship, in turn, to lesions of the cer-

vical part of the spinal column. Space does not permit a discussion of this subject herein. It is sufficient to say that there is a definite interrelationship, and that differential diagnosis of the underlying conditions often is a difficult problem. In cases of pain in the shoulder with secondary pain in the arm, relief of the arm pain will follow relief of the underlying shoulder condition.

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1947 ASSEMBLY SITE AT ST. LOUIS

The St. Louis Auditorium which will house the exhibits and entire medical program of the 1947 Assembly of the Interstate Postgraduate Medical Association, scheduled for October 14 to 17, inclusive.

# Psychosomatic Aspects of Problem Cases in the Practice of Medicine

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**P**SYCHOSOMATIC describes an approach to medicine as old as the art of healing itself. It is not a specialty but rather a point of view which applies to all aspects of medicine and surgery. It does not mean to study the soma less but to study the psyche more. Its subject matter is founded on the important advances in physical medicine as well as on the biologically oriented psychology of Freud, without whose epochal discoveries no work on psychosomatic medicine could be attempted.

Physicians have always known that the emotional life has something to do with illness, but the structural concepts introduced by Virchow led to the separation of illness from the psyche of man and a consideration of disease as only a disorder of organs and cells. With the concept of the separation of disease into many different ailments came the development of specialists to attend to all the distinct diseases. With the specialists came the introduction of instruments of precision, and the mechanization of medicine began. Medicine now contented itself with the study of the organism as a physiologic mechanism; blood chemistry, electrocardiography, and other methods of

physical investigation were highly regarded, while the psychologic background of the patient was often looked down upon, since it was considered not so scientific as the results of laboratory studies. This period may, in truth, be referred to as the "machine age in medicine." It is not to be denied that remarkable developments have occurred during this period of laboratory ascendancy, but it also must be admitted that the emotional side of illness has been almost entirely neglected.

## PSYCHOSOMATIC PROBLEMS

Defined as bodily disorders whose nature can be appreciated only when emotional factors are investigated in addition to physical factors, psychosomatic affections can be studied in the following manner:

1. Between the small number of obviously psychotic patients and the larger number who are sick solely because of physical disease, and in whom emotional factors play no part, the physician sees a vast number of sick people who are not "out of their minds" and yet do not have any definite bodily disease to account for their illness. Psychosomatic medicine is much concerned with the latter group (Group I). It is reliably estimated that about a third of the

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patients who consult a physician fall into this classification. These constitute the so-called purely "functional" problems of medical practice.

2. Another large group of patients who consult a physician have symptoms that are in part dependent upon emotional factors, even though organic changes, of nonpsychogenic origin, are present (Group II). This second group is even more important than the first from the standpoint of diagnosis and treatment. Their psychosomatic problems are often very complicated and, because serious organic disease may be present, the psychic factor is capable of doing more damage to them than to those in the first group. This phase of the subject is especially well illustrated by many instances of organic heart disease. While a neurotic with a normal heart may suffer a great deal subjectively and may even have a disturbance of cardiac function marked by various forms of arrhythmia, the heart, certainly in the majority of such patients, remains structurally healthy. But the neurotic patient who has organic heart disease may add a real burden to the work of his heart, either through constant tension of psychic origin or, more especially, by means of acute episodes of emotional origin. This may hasten a cardiac breakdown which might be indefinitely postponed if there were no psychic stress. Thus the psychic factors may be even more important than the physical in producing incapacity.

3. Psychosomatic medicine is much interested in disorders generally considered wholly within the realm of "physical disease," which have to do with the vegetative nervous system, such as migraine, asthma, peptic ulcer, and essential hypertension (Group III). It is believed that psychic factors may be of great importance in their etiology and, of even more importance, in their management.

#### PRESENT MANAGEMENT

*The illness is "functional"*—How does modern medicine handle patients whose problems are primarily psychosomatic? When we review



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our present management we find that the patients in Group I are commonly told that no organic disease is present and that the whole thing is "functional." They are often dismissed without further care, only to land eventually in the hands of some irregular practitioner or quack healer. Certainly in dealing with many of these patients it is necessary to do more than assure the patient of the absence of physical disease. Nor does it do to dismiss a patient with the statement that his illness is "functional." To the physician this term usually means "psychogenic," although he does not always admit it even to himself. All kinds of twists and turns are taken to avoid the use of the hated term, psychogenic. Often "neurogenic" replaces it and thus the physician is permitted to cling to the notion that somehow there is a physical answer to the problem. This point will be discussed shortly.

Sometimes the patient is told that the physician does not think that anything is the matter, but suspicion is cast upon some organ

or system which needs watching and care. For example, the patient with symptoms referred to the heart region is told that his heart is all right. Nevertheless, he is cautioned to rest, medicine is given, and each time that he visits the physician his heart is examined again, or his blood pressure is taken. It is impossible to eradicate the suspicion of organic disease under such circumstances. This point will be considered later, but here it may be emphasized that in dealing with the majority of functional problems we must examine thoroughly, satisfy ourselves as to the absence of physical changes and then stop examining with the statement, "You have no evidence of organic disease."

*Pathologic curiosities*—Very frequently, following thorough study by means of the usual medical history, physical examination, and laboratory investigation, some "pathologic curiosity"\* is discovered which really has nothing to do with the illness, but the patient is then treated from the standpoint of organic disease, and is subjected to unnecessary medical or surgical treatment, which in many instances intensifies the neurotic condition. For example, a common cause of fatigue is not infection but emotional conflict which uses up so much energy that little is left for other purposes. A patient with chronic fatigue may be studied from every possible physical standpoint and finally—especially in the presence of long continued, low fever—suspicion rests upon minimal (and obsolete) tuberculosis of the lungs. Long periods of rest in bed or sanatorium may follow.

The error in the study of such cases is the fixation on physical factors and the absence of attention to emotional factors so that the physician himself becomes a pathogenic agent in helping to fix the neurosis.

#### ORGANIC TRADITION IN MEDICINE

As a consequence of this structural and physiologic tradition in medicine, a large number

\*By "pathologic curiosity" is meant some congenital or acquired lesion that has no significance from the standpoint of the present illness.

of physicians pride themselves upon their unwillingness to concede the absence of physical disease when dealing with an obscure illness. In discussing such a patient they are apt to say, "but there must be something the matter," meaning that there must be a physical basis for the illness. And they furthermore believe that future researches along the lines of physical medicine will eventually uncover the hidden causes—infectious, allergic, endocrine, or metabolic—responsible for such obscure illnesses.

Still another group of physicians are willing to believe that psychic factors have something to do with illness, but they have only a vague notion of the part that such factors play. These physicians recognize that there is a "neurogenic factor" or a "large nervous element" present, but they look upon it as a secondary feature and probably a consequence of the physical disorder. While freely acknowledging the relation of psychic causes to such physiologic phenomena as blushing, weeping, gooseflesh, vomiting, and diarrhea, they nevertheless find it difficult to believe that more prolonged (chronic) disturbances of a physiologic nature can possibly be psychic in origin.

They are the physicians who often remark about a patient, "but he doesn't look neurotic," perhaps imagining that such a patient should, by his general apprehension or by evidences of physical nervousness, betray the fact that neurosis is present. Their approach to the emotional problem is apt to consist of the question, "Are you worried about anything?" Unfortunately, most neurotics do not betray the neurosis in their appearance, nor is their emotional problem so simple that the direct question, "Are you worried about anything?" will produce material of importance.

THE special point of this presentation is that psychosomatic technics of diagnosis and treatment must become an integral part of the practice of medicine so that physicians may fulfill their promise and meet the challenge of present-day medical problems. The enormous number of psychoneurotic and psychosomatic

problems turned up by the Selective Service process and encountered in military medicine indicates where the emphasis must be placed in the future practice of medicine. It is my belief that just as World War I established psychiatry on a firm scientific basis, so will the knowledge derived from World War II bring about the final integration of psychiatry into medicine—in other words, into the practice of psychosomatic medicine.

#### PSYCHOSOMATIC APPROACH TO DIAGNOSIS AND TREATMENT

If we are to deal effectively with emotional problems in illness and disease, physicians must be given a basic training and experience in psychopathology parallel with and equal to their training in tissue pathology. In the same manner that a wise and experienced gross pathologist makes shrewd guesses from the gross appearance of the organs, so may the experienced clinician make shrewd guesses from gross distortions of the personality. But he is in a much happier position if he knows the underlying structure of the personality. Such knowledge is now available, and our medical schools are gradually beginning to teach it. Moreover, this knowledge must become an automatic part of medical thinking and of the management of patients.

Therefore, from the moment that the general physician meets his patient he must be trying to differentiate or evaluate somatic disease, distinguish the early or borderline psychoses, and estimate the role of the emotions in producing symptoms. Thus he must be able to establish positive data in regard to the personality structure of the patient—the relationship of symptom to conflict and the discovery of the secondary gain and of the choice of symptom.

OF A GREAT number of clinical syndromes among psychosomatic disturbances I can select only a few for special comment.

Constipation and headache are among the most frequent symptoms confronting physi-

cians in their daily practice. Probably the most commonly assigned cause of headache is constipation and it is obvious why this should be so. On the assumption that obstruction or accumulation leads to absorption of toxins from the gastrointestinal tract which may prove poisonous and that a symptom of such poisoning is headache, a great many sufferers from headache are addicted to the laxative, enema, or colonic irrigation habit. We cannot say that there is no such cause of headache, but certainly it is overemphasized by both the laity and the medical profession and is exploited by drug houses and by institutes for colonic irrigations. Every physician has had the experience of observing patients who are constipated for many days and do not have headaches. They are also familiar with the headache victim whose headache disappears magically just as soon as the bowels move—too soon for a physiologic mechanism to be responsible.

M. F., a white girl of 19, was first seen in the spring of 1942. She complained of constipation of several years' duration, headache, ulcers in the mouth, and fatigue. She had never been seriously ill and there were no other symptoms of importance.

The general physical examination showed no evidence of disease, and it quickly became apparent that more important than the symptoms of which she complained was a high degree of social anxiety which had interfered with her social development. Insecurity in personal relationship was related to the insecurity of childhood, and the constipation apparently was a reflection of the tension growing out of social situations, such as competition with a pretty cousin.

The origin of the symptoms was made clear, and when she was reassured about the insignificance of the constipation and was encouraged by the physician, who assumed the role of a friendly parent in trying to give her a little more self-confidence and urging her to cultivate new interests and friends, she improved remarkably and blossomed out into a friendly creature who, in turn, "found everybody more friendly." Incidentally, constipation

ceased. During a period of a year and a half her progress continued and then suddenly new symptoms appeared—vertigo and pain in the epigastrium. It was not difficult to ascertain that she was again forced to compete with a very attractive young woman in a new circle of boys and girls in which she felt insecure. A single interview succeeded in pointing out the source of anxiety and in giving more reassurance and more self-confidence.

Here, without mentioning psychotherapy, the physician assumed the parental role and took the attention of the patient away from the symptom. Reeducation regarding the workings of the body and some insight regarding the growing pains of delayed emotional development were the basis of the brief psychotherapy. There is no question but that this patient will have to return from time to time as she encounters new situations. Is it not better, however, to treat the patient in this manner than to make her dependent on laxatives or enemas and perhaps start her on a career of gastrointestinal invalidism?

**A**NXIETY states with gastrointestinal symptoms are among the most common of all psychosomatic problems. The most frequent rationalization of anxiety in these problems is fear of cancer—cancerphobia, which, in a way, represents a crude index to the severity of the neurosis. The intensity of the fear, the degree of reassurance necessary to resolve it, the frequency with which it returns, and the capacity for enlightenment serve as clues to the differential diagnosis between a simple anxiety state or a borderline psychosis. In the ordinary case, cancerphobia frequently makes its appearance at the end of a medical examination when the patient laughingly states after reassurance, "I am so relieved because I thought I might have a cancer." Brief psychotherapy finds its greatest usefulness in the milder anxiety states. Where conversion mechanisms are concerned, an approach based on "organ language" often permits a ready access to significant psychological material.

#### ORGAN LANGUAGE

This method of helping patients to understand their symptoms is based upon the symbolism of symptoms. Patients are told that if they cannot find an outlet for tension of emotional origin by word or action, the body will find a means of expressing this tension through a kind of "organ language." The psychopathology responsible for organ language cannot be discussed in detail, but many clinical instances can be cited.

For example, if a patient cannot swallow satisfactorily and no organic cause can be found, it may mean there is something in the life situation of the patient that he "cannot swallow." Nausea, in the absence of organic disease, sometimes means that the patient "cannot stomach" this or that environmental factor. Frequently a feeling of oppression in the chest accompanied by sighing respirations, again in the absence of organic findings, indicates that the patient has a "load on his chest" that he would like to get rid of by talking about his problems. The patient who has lost his appetite and as a result has also become severely undernourished—so-called "anorexia nervosa," which in its minor manifestations is such a common problem—is very often emotionally starved before he becomes physically starved. When he learns to taste life he will begin to taste food. The common symptom fatigue is very often due to emotional conflict which uses up so much energy that little is left for other purposes. Again, emotional tension of unconscious origin frequently expresses itself as muscle tension, giving rise to aches and pains; sometimes these are represented by sharp pains such as atypical neuralgia. Thus, I suggest that atypical neuralgia of the arm or face may be due to focal conflict as well as focal infection. An ache in the arm, instead of representing the response to a focus of infection, may mean that the patient would like to strike someone but is prevented from doing so by the affection or respect that is mingled with his hostility. Itching for which no physical cause is found very often represents dissatisfaction with the environment which the individual takes out upon himself;

martyr-like, he scratches himself instead of someone else. "All-gone" feelings in the epigastrium, "shaky legs," and even vertigo are common physical expressions of anxiety. The anxiety attack, so frequently called a "heart attack," a gallbladder disturbance, hyperthyroidism, neurocirculatory asthenia, hyperinsulinism, etc., is still far from being understood in general clinical medicine even though Freud described it more than forty years ago.

#### GASTROINTESTINAL MANIFESTATIONS

Only one more point remains before concluding this part of the discussion—the gastrointestinal tract is, above all other systems, the pathway through which emotions are often expressed in behavior. Why this is so becomes apparent in the study of psychopathology.

This whole approach can be summed up in the following fashion: Understanding illness and treating sick people consists of something more than a knowledge of disease: it necessitates looking upon illness as an aspect of behavior. It means that the nature of bodily disorders can only be appreciated when emotional factors are investigated in addition to physical factors. Such an approach can be applied to a wide variety of ailments and can be utilized very generally in talking with patients. Nor does it require a very high degree of intelligence on the part of the patient to follow this simple explanation. Patients in the clinic as well as those under private care can be dealt with in this fashion and the former are just as susceptible as the latter to these psychosomatic disorders.

Much has been written on the subject of depression and gastrointestinal manifestation, but the general physician cannot be reminded too often of the necessity for recognizing the mood disturbance underlying the gastrointestinal symptoms. This is very often true in the so-called "colitis" cases. An irritable colon, dependent upon emotional factors, is the usual mechanism, just as it frequently is in "non-calculous" gallbladder disease. Suicides, totally unlooked for by the general physician, are

sometimes the sorry aftermath of a long period of bowel treatment and gallbladder drainage.

**E**VEN more complicated are the associations between the gastrointestinal tract and the cardiovascular system. The following case illustrates some of these problems.

H. G., a white man of 50, first consulted me in 1929. He complained of pain in the epigastrium, which had made its appearance about three years before when he noticed a pressure-like sensation. No abnormality was detected in the physical examination except a few bad teeth. These were removed and the patient was advised to stop smoking. His digestion improved and he was not heard from again until 1935, when he complained of fullness after meals. Again, no abnormalities were detected except slight elevation of the systolic pressure. At the same time he spoke of being short of breath on exertion, but only after breakfast. This again seemed to be a pressure-like sensation rather than dyspnea. However, because of this symptom special attention was paid to the cardiovascular system, but clinical, x-ray, and electrocardiographic examination revealed no abnormality. When, a short time later, x-ray of the gastrointestinal tract showed typical duodenal ulcer deformity and the possibility of additional esophagitis—on the basis of a rather spastic esophagus with evidence of hyperactive peristalsis—attention was directed away from the cardiovascular system.

The patient was a very reserved, passive individual with pronounced feelings of inferiority. He had a neurotic, nagging wife and two daughters, one of whom was hysterical. Financial difficulties had also played a part in his digestive problem.

With superficial psychotherapy and certain general medical measures such as diet and sedation, he improved somewhat but continued to have the pressure-like clogged-up feeling, especially in the mornings. Between 1938 and 1941 he was much improved, although the symptom never disappeared completely. In 1941, the symptom was less pronounced, but the



blood pressure was elevated and the electrocardiogram showed changes. X-ray study indicated that the duodenal ulcer was completely healed and there was no further evidence to suggest esophagitis. Attention once more was focused on his cardiovascular system as well as upon his psychologic problems.

His daughter's marriage had ended in divorce; his wife was becoming more and more difficult, and for the first time he confessed that he had been sexually frustrated for years.

In 1942 he had a slight attack of congestive heart failure and was sent to the hospital where he made a good recovery. After his recovery he remained at home for several weeks but was very depressed and complained of headache and nausea. His blood pressure had been steadily rising over the years and he now showed persistent hypertension. His daughter wrote to me that he was so disconsolate that they did not know what to do with him at home and urged me to give him a "pep talk." On his next visit to me I talked to him on the necessity of cultivating a fighting spirit. He walked out of the office apparently feeling better and when he got home his family remarked on his better spirits. That night after he retired to his room at the usual time, the family heard a thump on the floor and ran up to find that he had collapsed. Apparently he had died instantly. Fortunately for my peace of mind he had not exerted himself after his visit to me. The family assured me that he had done nothing different from usual.

Here was a very passive, inhibited man with pronounced feelings of inferiority who complained of indigestion and pressure under the sternum. He was studied carefully to exclude heart disease. Duodenal ulcer and esophagitis were demonstrated. Emotional factors seemed important. The ulcer healed but hypertension developed; progressive myocardial changes occurred; and sudden death happened to follow a "pep talk" for depression.

This case once more emphasizes the importance of angina pectoris as a cause of death and, further, the difficulties in diagnosis sometimes encountered. Because of the negative cardio-

vascular and the positive gastrointestinal findings it was decided in the early years of his illness that a digestive disturbance, into which emotional factors entered, was wholly responsible for his illness. Later, however, when there was evidence that the ulcer had healed and there was no longer any suspicion of esophagitis and, at the same time, positive evidence of cardiovascular disease appeared, the diagnosis was reversed, although we could never be certain that some functional disturbance of the gastrointestinal tract on an emotional basis was not also present.

I would like to deal with many other clinical syndromes but time permits only the briefest mention of a few. Hypoglycemia in relation to various symptoms is a frequent diagnosis nowadays. Low blood sugar, like low blood pressure, is often held responsible for a state of fatigue when the hypoglycemic state is often a part of the mechanism of the psychosomatic reaction—the physiologic response to emotional stress. Occasionally, indeed, it is a primary defect as in island tumors of the pancreas, but usually it is only a secondary symptom.

**M**ANY patients with fatigue have low fever of obscure origin and all the attention is centered on finding the cause of the fever. Formerly such patients were often thought to have early tuberculosis and frequently spent long periods in sanatoria. Now chronic brucellosis is apt to be held responsible.

In dealing with patients of this kind we must map out a program of investigation and prosecute it actively; then within a certain limited time, having assured ourselves that there is no organic disease present, we must say to the patient, "You do not have organic disease; the slight fever is not important; throw your thermometer away and let us get after the cause of fatigue because that is your main problem."

More important than searching forever for the cause of the fever is to realize that it is not the most important part of the problem but simply represents one phase of a disturbance in the constitutional make-up of the individual,

of which the disturbance in the emotional life represents another and more important phase. It is more important because the patient frequently derives great benefit from an improvement in his life brought about by only brief psychotherapy.

Since we are speaking of common disorders it is pertinent to add that vitamins are the order of the day. Not only are vitamins administered in the relatively few conditions for which it has been proved that they are specifically indicated, but in addition every obscure illness, physical or psychologic, gets its complement of vitamins. To the medical profession, which is eager to find a physical answer to all medical problems and to the gullible public, which wants to swallow a magic pill to abolish any and all ills, vitamins provide a common solution. The "vita" half of the term is not without significance in this connection. Drug houses and department stores, candy shops and slot machines, peddle vitamins to the extent of many million dollars annually—money which would go a long way in psychosomatic medical teaching and research. Apparently we must exhaust our credulity in regard to this cause of illness as we have with focal infection and autointoxication.

#### THE MALE CLIMACTERIC

Only a little less abused than vitamins are the endocrine products in the present-day practice of medicine. With the increased interest of the medical profession in endocrinology and the exploitation of this interest by pharmaceutical houses in marketing endocrine products, a new flood of lurid literature has crossed the physician's desk on what is termed the male climacteric, or, even less aptly, the male menopause. Anything that happens to a man of 50 that cannot be accounted for on the basis of physical disease is now apt to be blamed on gonadal insufficiency and he then gets a series of expensive injections of testosterone. It is the exact counterpart of the problem in the female whose every functional illness around the age of 45 is blamed on the menopause and treated with estrogens. How to separate fact from fic-

tion in these problems is indeed difficult, but I submit that we have not yet reached the stage where we can accurately treat emotional disturbances with endocrine products. Perhaps the time will come but it is not here yet. Meanwhile I recommend scientific psychotherapy in addition to, or in place of, endocrine therapy.

The male climacteric is said to be characterized by nocturnal urinary frequency, fatigue, indecision, hot flushes, and decreased libido. Other symptoms such as vertigo, mood changes, headaches, gastrointestinal symptoms, a feeling of inadequacy in undertaking new duties, and a tendency to seclusion are sometimes included as a part of the syndrome. Most of these symptoms have been conspicuous in the psychoneuroses. Certainly they often arise from emotional conflict and can be effectively treated by psychotherapy.

R. K., a white man of 53, was first seen in 1935. He had an acute respiratory illness from which he made a quick recovery. The illness afforded me the opportunity of getting acquainted with the patient. He had always been a teacher in a small town and had one son, who had referred the patient to me.

I did not hear from him again until 1940, when he stated that he had been working hard, smoking moderately, and taking an occasional drink. For the last two or three years there had been a gradual diminution in his sex desires—"it had never meant much to him."

The physical examination was negative except for a slight elevation of the blood pressure which had not been noted five years previously. There was slight tremor, and on further questioning the patient stated that he had become a little more intolerant to heat and somewhat irritable. In my note of that visit I observed the following familiar, differential diagnostic problem with which I was concerned at the time, namely, anxiety-neurosis, so-called neurocirculatory asthenia, mild hyperthyroidism, and, in relation to the whole problem, the question of the male climacteric. Laboratory studies were negative and his basal metabolism was normal.

The son told me that his father had been getting more irritable during the past year and

suggested that he was worried about the future. On that basis I began the discussion, using the illustration of "body language"—that dizziness and vertigo may be the body's physical expression of insecurity. He said that since the new governor had come into office a bill had been passed forcing the retirement of teachers at the age of 62 and in his case this would provide only a small pension which would be insufficient for him and his wife to live on. He had invested all of his money in his son's education and wondered whether the son would be willing and able to take care of them. As he discussed this problem he became very emotional and it was obvious that this was the point that was disturbing him. I spoke about the son's future and the fact that he wouldn't let his father down and then reassured him as to the absence of organic disease.

He remained well for more than three years. Then he began to lose weight and became worried and fretful. The physical examination showed frequent irregularity in the heart rate, and the electrocardiogram indicated evidence of early myocardial disease. Otherwise the examination was negative and the basal metabolism was still within normal limits. The patient was smoking heavily. His wife's illness and the necessity for looking after her himself "had been too much for him." In addition, his son had entered the service and this had reactivated his insecurity.

HERE WAS an average man reacting to stress and strain by presenting some of the psychic, sexual, and vasomotor disturbances that are sometimes associated at this period of life and are now often referred to as the male climacteric. Whether they should be is not so much the question except in so far as such a classification affects treatment. In general, it may be said that too much is apt to be blamed on the menopause, just as in the woman, and treatment is apt to be restricted to endocrine products. In this case very simple psychotherapy did a great deal. It was the kind of psychotherapy that any physician should administer. It is sim-

ply a normal part of the physician-patient relationship but it depends upon a knowledge of psychopathology. Here, too, we see the necessity for equal attention to tissue pathology as we watch this middle-aged man developing degenerative heart disease, which of course will also enter into the question of his emotional problems to produce indissoluble psychosomatic relationships.

#### POLYSURGICAL ADDICTION

The chronic gastrointestinal individual with a battle-scarred abdomen of polysurgical addiction is fortunately not quite so common now because surgeons are becoming a little more wary of operating for exploratory reasons. "The unconscious will to remain sick" is a very important consideration in medicine and in this kind of patient it is of paramount importance. Such patients are really eager to be operated upon, and in their insistence upon the continuous and excruciating nature of the pain from which they suffer one can easily understand how a very sympathetic surgeon may be prevailed upon to operate. This is particularly true when such patients meet surgeons who are not loath to operate. Thus, we can say that a willing and even eager patient who derives a certain satisfaction from being hospitalized and operated upon and a surgeon who is ever ready to wield a knife is a very unfortunate combination. A great many patients with numerous scars on the abdomen serve as testimony to this combination.

My attention was first called to this important problem many years ago by the following case:

A young woman at the age of 19 had her first attack of pain in the right lower quadrant. At 20 the appendix was removed. Six months later she had a pelvic operation because of painful menstruation. At 26 years she had her third operation for abdominal adhesions. For the next four years she complained more or less constantly and had been in bed for considerable periods because of the pain in the right side. Stricture of the right ureter was suspected but

not proved and finally, after a great deal of hospital investigation, a fourth operation was performed in the belief that there was disease of the large bowel; however, all organs were found to be normal.

Here, then, was a patient who had been incapacitated for many years and who, during this period of time, had been repeatedly subjected to searching physical investigations and many abdominal operations. What the many physicians attending her had not discovered, or else did not know the significance of, was that this long illness began shortly after the fourth of her five sisters married and this patient thought that she would in all likelihood remain a spinster and would then endure a life of drudgery and comparative loneliness. Meek and submissive, unattractive and unintelligent, she unconsciously turned to illness when she found it impossible to compete with her sisters' superiority. Further personality studies disclosed her very immature emotional development and also confirmed the opinion that the sister's marriage had precipitated an invalid reaction in this psychoneurotic individual.

A GREAT many chronic invalids with multiple surgical scars upon the abdomen have begun their invalid career with the simple removal of a so-called "chronic appendix." Fortunately the problem is not now encountered as frequently as it was fifteen or twenty years ago. At that time operations for pain in the right lower quadrant of the abdomen were frequently done for "chronic appendicitis," and the pathologist, we may say, played into the surgeon's hands by reporting involuntional changes in terms of disease. Please do not think that I am accusing the surgeon of a deliberate deception—quite the contrary—he was deceived by his organic training into thinking that he could cut out of the body a pain that had its origin in the emotional life. I am not going to discuss whether there is such a thing as "chronic appendicitis," but we certainly know that it is not nearly so common as was once believed.

The question of psychologic preparation for

surgery is one of the major problems in medicine. Surgeons are always so careful to prepare their patients physically for surgery; they would never think of performing a major operation without knowing that the cardiovascular-renal system had been surveyed; yet they rarely consider the personality of the individual who is about to be operated upon; how much anxiety is present, or what effect a surgical traumatic experience may have upon the personality structure.

We recently had in the hospital ward a woman with an enlarged thyroid gland which was removed because of "smothering" sensations. No effort was made to study her psychologically. The anatomic problem loomed large in the clinical picture but the patient was very apprehensive prior to operation and after operation became completely psychotic.

#### SUMMARY

The main point of this discussion can be stated briefly: the study and treatment of illness constitutes much more than the investigation and eradication of disease. And yet there is nothing new or startling in this viewpoint. We have heard a great deal in recent years about the study of the organism as a whole, but for the most part we have been paying only lip service to this concept. We have been led to believe that the art of the physician—having to do with his common sense or intuition—as opposed to his science, is sufficient to grasp the problems that we have been considering. It is not enough. A real understanding of psychopathology is necessary in order to study the emotional life in relation to ill health. In other words, the physician must be able to define the specific mental factors producing the illness, rather than to be satisfied with vague generalizations about "neurogenic background." Just as we would criticize the physician of today who would call all fevers malaria, so we must criticize the physician of tomorrow who hints vaguely at nervous factors in the background of an illness and makes no real effort to understand the psychic situation.

# Diagnosis and Treatment of Retrorectal Abscess

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TO THE doctor who is not familiar with retrorectal abscess, such a case is a formidable problem. The proctologist familiar with the problem can usually diagnose the condition at once. If a correct diagnosis is not made, subsequent inadequate treatment will result in a chronic fistula. This abscess is located posterior to the rectum, anterior to the lower portion of the sacrum, above the levators and below the peritoneal reflection. When the examining finger of the gloved hand is passed through the anal canal and hooked backward toward the sacrum in the lower limit of the rectum, in nearly every case the diagnosis of retrorectal abscess may be made or eliminated.

The chief hazard of this abscess is the blunder of making a rectal incision into the abscess. The rectal wall is not as thick as is sometimes assumed. This abscess may be mistaken for a submucous rectal abscess. We have an old rule that we have been teaching for years which says, "Abscesses and fistulae do not penetrate fascia." The infection which created the abscess did not arrive by penetration of the rectal wall.

To handle a retrorectal abscess intelligently, it is important to understand how the abscess arrived in its location. The lack of this knowledge puts the surgeon in the position where he

is likely to make his first and last incision through the rectal wall into a retrorectal abscess. The writing of this article was prompted by such a case. The patient now has a fistulous opening posteriorly in the rectum, plus two other openings showing on the skin over the ischiorectal fossa. It seems unquestionable that the original condition was a retrorectal abscess. It is now a fistula with a large, jagged opening posteriorly in the rectum and two separate openings in the left buttock leading into the ischiorectal fossa. The opening of this ischio-rectal abscess failed to relieve the patient or to clear up his pain.

A retrorectal abscess coexisting with an ischio-rectal abscess is not a rarity. The case has been cited to emphasize the mistake of opening such an abscess into the rectum. These are not submucous abscesses.

Retrorectal abscesses originate in a crypt in the posterior midline of the anus. The pus, under pressure, finds its way backward into the anococcygeal triangle. If the path of least resistance is then upward between the fibers of the levator ani muscles and the posterior wall of the rectum at the anorectal junction, an abscess will develop posterior to the rectum, in the position described in the first paragraph of this article.

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The preceding description should not be interpreted as meaning that every abscess developing in the anococcygeal triangle will extend upward, forming a retrorectal abscess. There are many things which may happen when pus develops in the anococcygeal triangle. It is not my intent to cover all such contingencies in this article, but rather to endeavor to describe the diagnosis and treatment of retrorectal abscess.

It is not commonly understood that the retrorectal abscess is also the common type of supralelevator abscess. A supralelevator abscess other than a retrorectal abscess is a quite rare condition. It seems to be the general impression that supralelevator abscesses are located to the right and left of the rectum above the levator ani muscles. Such abscesses, however, are not seen often. The large ones are retrorectal, ischioirectal, or, what is quite common, combinations of the two.

It is difficult to write about retrorectal abscess without discussing ischioirectal abscess, since the two are so frequently encountered together. The condition in which the retrorectal abscess is found in combination with ischioirectal abscess is not generally understood. The diagnosis of ischioirectal abscess is simple, but in many cases this diagnosis will be incomplete. The idea that ischioirectal abscess is an entity and is due to "blood-borne infection," is, in my opinion, an inherited, unjustified presumption.

In the past fifteen years, I have seen few ischioirectal abscesses that did not frankly originate in the posterior midline of the anus, in one of the three or four crypts closest to the posterior midline. A considerable percentage of these abscesses extend first from the crypt to the anococcygeal triangle and thence to the ischioirectal fossa. Another type, starting from crypts slightly to the right or left of the posterior midline, goes directly to the ischioirectal fossae without involving the triangle. Other abscesses extend upward from the triangle to form a retrorectal abscess, and then under back pressure and following the line of least resistance, may arrive in the right or left ischioirectal fossa.



FRANK D. STANTON

The doctor who has cleared up the ischioirectal abscess only to find that he has an internal blind fistula in the posterior midline of the anus, was deficient in his original diagnosis; he is now dealing with a retrorectal fistula. Few exceptions to the following statement will be found: The posterior midline internal blind fistula which remains following abscess or fistula surgery is the remains of a retrorectal abscess.

**I**F THE retrorectal abscess is still an abscess, that is to say, if it has not drained spontaneously, then the first step in the treatment is simple. We use local anesthesia almost exclusively. Low spinal anesthesia is also satisfactory.

For treatment, an incision is made in the posterior cleft, beginning about one-half inch posterior to the margin of the anus and extending backward as far as is practicable without damaging the periosteum of the coccyx. With a pointed Bard-Parker, the incision should

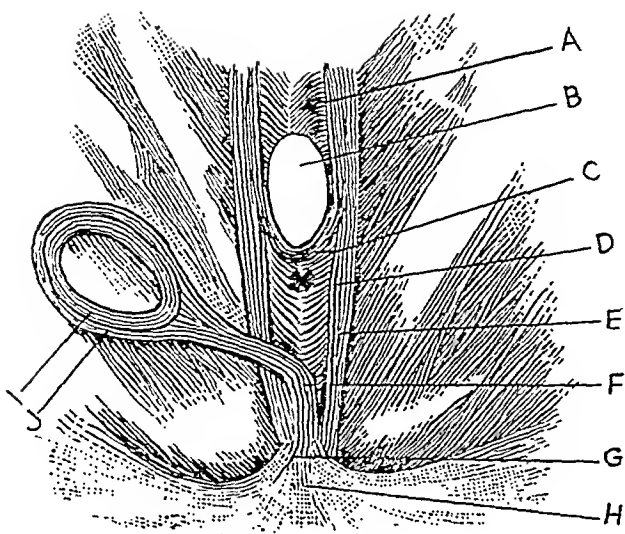


Figure 1

- A. Pelvic diaphragm.
- B. Anus.
- C. Puborectalis portion of levator ani muscle.
- D. The point where pus from an abscess in the post-anal space penetrates the pelvic diaphragm to form retrorectal (supralelevator) abscess.
- E. Pubococcygeus portion of levator ani muscle.
- F. Superficialis and profundus portions of external sphincter muscle attached to coccyx.
- G. Attachment of pubococcygeus to coccyx.
- H. Coccyx.
- I. Subcutaneous portion of the external sphincter muscle.
- J. Superficialis and profundus portions set aside to expose the pelvic diaphragm.

then be extended upward in the posterior mid-line until the abscess is reached and drained. If the operator is in doubt regarding the diagnosis, it is quite reassuring to pass a long aspirating needle upward to the site of the abscess and aspirate pus. We prefer making these incisions with a hot knife, the Post cautery.

When the abscess is reached, the scalpel or hot knife should be turned in such a way that an incision will be made crucial at its upper limit. This is intended only for that location where muscle fibers surrounding the point of entry into the supralelevator area are likely to be separated only by the incision. It seems bet-

ter that the incision be made a crucial incision at this high point. If the incision is made with a knife that is not too hot, the coagulum formed by the hot knife may help to some extent in delaying the closing of the wound. It probably is best not to do anything further at this first step. The wound should not be packed. The patient should be permitted to go home for two or three days. He is instructed to clean the area with soap and hot water, and is further instructed to stay out of bed. He may be up and down, but he must not stay in bed. Drainage will be more satisfactory if the patient is in an upright position a good deal of the time. Whether or not penicillin or other chemotherapy is employed is a matter of choice.

IT MUST now be kept in mind that the anal crypt, where primary infection was established, and the channel by which this pus found its way into the anococcygeal triangle are still present. It is a matter of choice whether or not the crypt is removed at the time of the primary incision. When the crypt is removed, the channel which lies above the subcutaneous portion of the external sphincter will be evident.

The external sphincter muscle consists of three bands of muscle. Two of these bands or portions arise at the tip of the coccyx, pass around the anus anteriorly, and back to the coccyx. The third portion of the external sphincter muscle, the subcutaneous portion, is the only part of the external sphincter muscle which completely surrounds the anus. If this anatomy is new to the reader, he will find an excellent presentation of the subject in Gorsch's *Perineopelvic Anatomy*. These newer discoveries of anatomy are the work of Milligan of London. Milligan's presentation supersedes the work of Hiller of Milwaukee (*Surgery, Gynecology and Obstetrics*, Vol. 3, No. 5, May 1931). Milligan's newer anatomical discoveries have allowed us to view our work with much greater clarity than we did as a result of Hiller's paper. Milligan's description of the external sphincter justifies the work which we were doing before we knew about the anatomy.

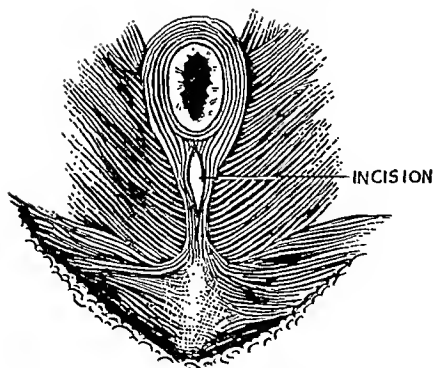


Figure 2. Incision for retrorectal abscess.

IT is just as well to delay the division of the subcutaneous portion of the external sphincter muscle at the posterior midline. If the patient suffers after the original operation, it may be found necessary to sever the subcutaneous portion of the external sphincter muscle sooner than might be done if the patient is not too uncomfortable. If the severing of the subcutaneous portion of the external sphincter muscle can be delayed for a week or two, it will be found that the original abscess incision will have filled in sufficiently so that the severing of the muscle will not permit the wound to gape as badly as it might do in some cases if the muscle is cut at the time of the original abscess incision. This will vary considerably with different patients. Another point is that, if at any time bleeding should occur in the posterior midline incision, the wound may be

packed to control the bleeding without holding the edges of the wound apart. There is sometimes difficulty in getting the posterior midline wounds to heal. If the posterior midline wound does not heal promptly, it may not heal at all until something is done to effect healing.

If the posterior midline wound is made too far in advance of the time when we want it to heal, it may become chronic. Furthermore, if the muscle is cut from the fistulous channel outward (downward) and is not cut upward slightly, there is a very good chance that the wound will not heal. This upward cut is the "back-cut of Salmon." An additional help in the healing of this wound is, after Salmon's cut is made upward from the internal opening of the channel, to suture the wound together at its upper limit.

As is true in most problems in proctology, success depends upon a number of little things. Our work is really quite easy, but unless all the seemingly minor things are done, success probably will not be attained. This is particularly true when dealing with retrorectal abscesses. As in most conditions, successful treatment depends primarily on correct diagnosis. Any treatment other than the correct one is likely to result in a worse condition than that which originally existed. After the abscess is drained, the result and the final healing depend on a number of little things which must be done expertly.

Retrorectal abscess is a common proctologic condition. Failure in its treatment is evidenced by the number of patients who are found who have been operated upon and who still have an internal blind fistula in the posterior midline of the anus. This internal blind fistula is nearly always due to unsuccessful treatment, or the failure to diagnose retrorectal abscess, or both.



# The Aging Heart

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SEVERAL years ago my two associates, Major Geraci and Captain Hirsch, and I studied carefully and in detail, over a period of six years, 400 cardiacs in the old age group—in the later decades of life, ranging from 50 to 80 years of age. We were looking for the answer to many questions, such as the following:

1. What are the most common types of heart disease encountered from 50 to 80 years?
2. What are the most common and the earliest symptoms and physical signs?
3. How much diagnostic help is afforded by the x-ray and the electrocardiograph?
4. What is the "Mediate" and "Immediate" prognosis particularly in the senile type of heart?

We published the results of our investigation in 1942, and they have no place in this discussion, except that in the course of this survey we discovered the following pertinent facts:

1. Arteriosclerotic or senile heart disease accounted for 31 per cent of the total 400 patients studied, and breaking that figure down, we found that patients with myocardial involvement predominating furnished 18 per cent and those with coronary symptoms, 13 per cent.

2. Hypertensive heart disease was second with 28.2 per cent.

3. Syphilitic heart disease ranked next, with 20.2 per cent. (This figure was relatively high because of the high percentage of colored patients in the survey).

4. Rheumatic heart disease came next with 12.5 per cent of which the mitral type was 10.5 and the aortic 2.0.

5. Thyroid heart disease accounted for 2.5 per cent.

6. Cardiovascular renal disease showed 1.6 per cent.

7. The percentage of those with no organic heart disease was 3.2.

In other words, if we include both heart muscle and the coronary type of heart, then the senile or arteriosclerotic type of heart disease outranked all others in people from 50 to 80 years of age.

I have taken the liberty of quoting this investigation, and I make a special point of this frequency of arteriosclerotic heart disease in the older age group for the following reason: Early in 1944 I published a booklet, *A Digest of Heart Disease*, a very elementary treatise. It was written specifically for the average doctor in general practice, for those thousands of members of our profession scattered through-

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out the 101 counties of the state of Illinois, as a sort of handy reference on heart disease. It was reviewed in the *Journal of the American Medical Association* in September 1944; in my opinion it was reviewed carefully and quite fairly, and I herewith express my appreciation to the anonymous reviewer for taking the time out of his busy life. However, in the course of that review, the criticism is made: "Under the heading arteriosclerotic heart disease, many cardiologists would doubt any common existence of the senile heart *per se* in persons in the fifties, for example. Also individuals vary much in the aging."

The figures quoted by me from our survey of 400 cardiacs speak for themselves. It is true that symptoms and signs of heart muscle failure due primarily to senility do not manifest themselves in *all* old subjects, and that they appear as a rule in the later decades, but as the reviewer himself points out, "Individuals vary much in their aging." Accordingly, I repeat we can and *do* encounter this clinical picture not too seldom in the fifth and sixth decades.

At the beginning of this discussion let me make a few points very clear. I grant that senility, particularly as it applies to the heart and its vessels, is variable. Some of us show symptoms and signs of "senile ectasy" in our fifth and sixth decades, others show them much later, and many die in their senility of an extracardiac cause without having experienced any heart symptoms. In the course of this paper I intend to enumerate the most common symptoms and signs and the x-ray and electrocardiographic evidence of those changes *when* they *do* occur.

**I**N CONSIDERING the senile or arteriosclerotic heart, I shall discuss it under two headings, even though clinically they frequently coexist: (1) the heart as an organ—its musculature, valves, and aorta; and (2) the nutrient vessels—the coronary arteries.

First, the heart itself—what are the earliest and most common subjective symptoms of heart muscle insufficiency in senescence?



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1. Dyspnea may be present, varying in degree from mild shortness of breath on effort to dyspnea while at rest, and orthopnea also may occur. The degree of dyspnea of course is in direct ratio to the extent of heart muscle insufficiency or failure, and by "heart muscle" I mean the *left* ventricle.

2. There may be heart-consciousness in various forms. For example, (a) consciousness of an arrhythmic heart due to auricular fibrillation or extrasystoles, either ventricular or auricular; (b) a forceful heart, particularly if associated with hypertension, or (c) changes in rate—a tachycardia—or the consciousness of a marked and progressive bradycardia. In our survey of 400 hearts in the old age group we encountered more "bradycardias" than "tachycardias" and these were on the basis of a "heart block" of varying degree and again purely part and parcel of senility and *not* due to a previous rheumatic myocarditis. Incidentally, there has been little or nothing in the medical literature on this!

3. In addition, there may be general symptoms, not *entirely* on a cardiac basis but with the failing myocardium at least partially responsible. I have in mind such symptoms as general fatigue, gastrointestinal flatulence due to impaired portal circulation, ankle edema, etc. Theoretically, too, it is possible that some of the vague yet consistent cerebral symptoms so commonly associated with senility—for example, amnesia, melancholia, etc.—are in *part* at least attributable to a failing circulation with the senile myocardium responsible, even though sclerosis of the cerebral vessels and brain changes are mainly responsible.

WHAT are the most common physical changes encountered in senile hearts?

1. The contour or shape of the heart is altered, with an increase or spread in the left ventricle as certified by the x-ray and a gradual widening of the sclerotic aortic arch.

2. There are soft murmurs, systolic in time, over the aorta and the apex. The former is probably on an arteriosclerotic basis; the latter is relative, owing to a spread of the left ventricular musculature.

3. Heart tones are soft and distant owing to loss of muscle tone.

4. The rate is frequently altered, either increased or markedly slowed.

5. The rhythm is commonly altered or disturbed, either in the nature of an auricular fibrillation or ectopic beats of one variety or another.

6. The blood pressure is not constant and there is no definite rule. In our experience a moderate hypertension and a mild hypotension are about evenly divided.

7. The electrocardiograph is of considerable diagnostic and prognostic value, particularly if it is run serially at fairly frequent intervals. It demonstrates and certifies not only changes in rhythm, but a progression of heart muscle change in the gradual distortion of the initial deflection.

The outlook, both mediate and immediate, in senile heart muscle insufficiency and even in

impending failure is remarkably favorable under careful management.

The treatment of senile heart-muscle insufficiency resolves itself around heart-muscle rest and active heart-muscle support. No definite routine can be laid down for the former except that each individual must be taught to stay within his energy quotient, by which I mean that the symptoms of dyspnea and heart-consciousness must serve as a guide. Individuals vary. Some can work and play and lead relatively strenuous lives short of symptoms. Others are limited in their capacity. All must, if possible, while active, remain symptom-free. *Active* heart-muscle support means, of course, digitalis. I believe most cardiologists have "about-faced" in the recent past on the usefulness of digitalis in senile hearts. Time was, not so long ago, when digitalis was considered a drug useful largely in the presence of acute decompensation. That it has prophylactic and *actual* value as a heart-muscle support in senile hearts and that its long-continued use builds up these senile hearts, I am convinced.

So much for the arteriosclerotic or senile heart-muscle, which brings us to a consideration of the coronary arteries. Now I appreciate that this of itself is a huge subject, and that it cannot be covered hurriedly, but I should like to give briefly a few general impressions.

Coronary artery disease is part of the process of senility. I grant that it occurs in early life but, basically and pathologically, coronary disease is part of the pottage of senility. Exclusive of those instances resulting from hypertension, syphilis, and those of embolic origin, the bulk of coronary disease is due to arteriosclerosis, more specifically atherosclerosis, and therefore *is* a senile form of heart disease. Furthermore, since coronary disease is due to arteriosclerosis, its pathology is progressive and so it seems to me we see it *clinically* too.

I should like to present coronary disease to you as a *clinically progressive* situation and discuss it under three heads: (1) angina of effort, (2) acute occlusion with myocardial infarction and necrosis, and (3) status angiosus.

Clinically, angina of effort, it seems to me, is

the earliest expression of coronary disease, and the pain or distress or dyspnea or strangulation is the result of a temporary coronary insufficiency. There is some evidence that the initial pain of angina of effort speaks for a previous mild heart-muscle infarction. The clinical picture of angina of effort is so well known it hardly merits description. The sudden onset of precordial distress, usually following physical effort or mental excitation, with classical reference into the jaws or the arms, unassociated with shock, and quickly relieved by coronary dilators or postural rest, is not very readily confused. It usually leaves the individual none the worse for his episode. The immediate management calls for no comment. Its duration is quite brief and corrects itself. However, the prophylactic management is another matter. If these attacks recur at frequent intervals, they predicate, in my opinion, a progressive pathology and an impending acute occlusion with infarction and call for a period of complete rest and careful observation.

The second stage in the clinical and pathological progress of coronary disease is acute occlusion with myocardial infarction and necrosis. The clinical picture is something like this:

1. As a rule the patient's history reveals previous milder symptoms of coronary insufficiency, possibly one or more seizures of angina of effort.

2. The mode of onset is usually sudden, either while at rest or following physical effort.

3. The physical signs are usually characteristic. A sudden onset of severe pain, dyspnea, or strangulation is almost always associated with shock and prostration. The heart itself is considerably disturbed, the rate being usually rapid, the rhythm usually irregular, and the volume very poor. There is a drop in blood pressure and an elevation of temperature—because of the inflammatory process in the myocardium—and the individual is desperately ill and senses it. The electrocardiogram in most instances shows a coronary pattern with distorted and inverted T waves within twenty-four to forty-eight hours.

4. The prognosis regarding not only life but capacity, both physical and mental, is good if properly and adequately managed; it depends, of course, upon the degree of infarction and necrosis.

AT THIS point I wish to express forcibly a personal opinion about the management of acute myocardial infarction on the background of acute coronary thrombosis. There have appeared recently in medical literature articles decrying the need for prolonged bed rest in the management of myocardial infarction due to acute coronary occlusion. For example, quoting verbatim from a recent article,\* the summary reads as follows:

"A review of some recent experimental evidence and certain clinical considerations leads to the following general conclusions:

"1. Extreme restriction of body movement causes increased mortality in animals with experimental myocardial injury.

"2. There is *no proof* that rest in bed carried out for many weeks after symptoms have disappeared is of value in the physical management of the patient with congestive failure, angina pectoris, or myocardial infarction.

"3. From the psychic standpoint there is a definite disadvantage in the enforcement of a rigid regimen after the acute phase of the illness.

"4. Until more definite information is available, the following tentative suggestions are offered for a plan of treatment which obviously requires modification according to the status of the individual patient:

"(a) Persons with congestive heart failure should be allowed out of bed for several hours a day, *as soon as severe dyspnea at rest has subsided*.

"(b) Following myocardial infarction, recumbency should not be prescribed for a longer period than *two or three weeks* after the more acute and alarming symptoms have subsided. The recumbent position should not be enforced

\*Harrison, Tinsley R.: Abuse of rest as a therapeutic measure for patients with cardiovascular disease. J.A.M.A. 125:16 (Aug. 19) 1944.

on patients who are more comfortable sitting. Other things being equal, it would appear wise to allow elderly patients out of bed sooner than younger ones.

"(c) Rest in bed more than a day or two at a time probably has no place in the treatment of angina pectoris except in those patients who are especially liable to develop in the immediate future myocardial infarction, as indicated by increasingly frequent and prolonged attacks at rest.

"(d) In all patients with the severe forms of heart disease, activity should be kept below the symptomatic threshold, i.e., should be less than that amount which induces dyspnea or pain."

Now I cannot subscribe to this theory of drastic curtailment of absolute bed rest following acute myocardial infarction, and I take issue particularly on the following points.

I feel strongly there is a three-point proof that this period of bed rest should extend into and beyond a minimum of six weeks:

1. Clinical proof: The instances of the return of symptoms directly attributable to the acute myocardial infarction, such as particularly dyspnea and pain, after not just a few weeks but a month, and in some instances even longer, are not isolated or exceptional instances but are encountered frequently. This is a potent argument in my opinion against the advocated early resumption of physical activities.

2. Electrocardiographic certification: The diagnosis of myocardial infarction due to coronary occlusion is arrived at largely clinically. Yet the electrocardiographic pattern also is very helpful, and in many instances not only corroborates but certifies the diagnosis. And this certification takes not a few weeks but often several months of absolute bed rest to revert to a normal pattern.

3. Postmortem evidence: Impressive statistics have accumulated in the past decade to show that an acute myocardial necrosis on the background of a coronary occlusion requires considerably more than a few weeks for adequate cicatrization.

Furthermore, in my opinion, it is unsafe and illogical to establish the advent of dyspnea and pain as a criterion for the degree of activity to be allowed a person with an acute infarction.

I grant that the management of acute coronary thrombosis with resultant myocardial infarction must be personal and individualistic, but it must be based on an adequate minimum of absolute rest, which to repeat, in my opinion, is not two or three weeks, but that many months.

As a supplement to rest, physical and mental, the management of acute infarction due to acute coronary thrombosis is largely symptomatic: oxygen for dyspnea, coronary dilators, sedatives, soft bland food, heart-muscle support with digitalis used cautiously in the presence of impending acute failure, etc. Because acute myocardial infarction due to coronary thrombosis is so frequently encountered, because in my opinion the detailed management is so important, and again because the proper care influences so markedly the prognosis, I should like to digress at this point to a summary of the proper and adequate care of this dramatic clinical entity.

1. The individual with (pathologically) a myocardial necrosis due to an acute closure of a coronary vessel needs *immediate and adequate* rest—absolute bed rest—not just several weeks, or a week or ten days beyond the disappearance of his symptoms of heart-muscle embarrassment, but, depending upon the degree or size of his infarction, one or two or more months.

2. His return to physical and mental activity should be gradual and guarded.

3. His diet should be bland, soft, and easily digestible; it should be given in small quantities and in frequent feedings.

4. In the presence of dyspnea he requires oxygen. The method of administration is a matter of choice—the tent, if dyspnea is extreme, the mask or catheter, if less pronounced.

5. Coronary dilators—intravenously or by mouth—serve a definite purpose and can safely be started early in the course of the management of the patient.

6. Sedation is of utmost importance. The type or kind is irrelevant. It may call for opiates and shade off into the barbiturates.

If coronary disease has as its basic pathology atherosclerosis (excluding those instances due to hypertension, syphilis and those of embolic origin), then certain other premises follow quite logically: it belongs primarily to the later decades of life and it is progressive, culminating in some instances and in some individuals with a very marked limitation of physical and mental potentialities in a state of status angiosis. Here we are, in my opinion, dealing with a chronic progressive *end* result.

The prognosis of status angiosis will vary naturally with the stage or degree of generalized sclerosis and atheromatosis. The management concerns itself largely with maintaining such an individual within his energy potentials through rest and coronary dilators.

**I**N CONCLUSION, I should like to leave the following impressions with you concerning coronary disease:

1. Most so-called instances of angina pectoris have sustained previous occlusions.
2. Coronary disease is a disease of senility, in spite of the not too infrequent instances in early life.
3. Pathologically it is due to arteriosclerosis and more specifically, atherosclerosis.
4. It is progressive and frequently culminates

as "chronic coronary insufficiency."

5. The pain, discomfort or strangulation is in all instances due to varying degrees of coronary insufficiency and a resultant myocardial ischemia.

6. The clinical diagnosis of "acute myocardial infarction" is based upon prolonged cardiac pain plus evidence of heart-muscle necrosis.

7. In early life the first segment of the left coronary is most frequently involved because it turns at almost a right angle.

8. In later life, the right coronary is occluded as frequently as the left.

9. More sudden deaths are due to left coronary lesions than to right.

10. Paradoxically, anastomoses between coronary vessels *increase* progressively with age.

11. Exceptional instances of advanced coronary sclerosis in very youthful individuals from the ages of 12 to 30 are encountered clinically and in the literature, proved by autopsy.

12. In youthful individuals, pathologically the thrombus is usually a vascularized, soft mass; in the old, the thrombus is calcified; and in middle age, it shows a combination of the two.

13. I have described a very definite clinical entity, which *I* see and *you* see frequently and constantly. Possibly I have theorized a bit, and perhaps some of my statements, particularly those applying to coronary disease, have not been certified, yet in their entirety they present, I believe, a true and important picture.

## DIAGNOSTIC CLINIC

# Selection of Cases for Gastric Surgery

BERNARD B. LARSEN\*

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**I**N THIS paper we shall review the indications for operation upon the stomach. For the sake of brevity, the discussion will be limited to benign ulcerative lesions of the duodenum.

Today the internist and the surgeon are in almost complete agreement that four-fifths of the patients with duodenal ulcer can be quite successfully treated by medical management alone. The indication for surgical intervention occurs only in complications of duodenal ulcer. In either medical or surgical management the gastric acidity must be controlled if the therapy is to be successful. That ulcers may in rare cases persist and even recur in face of a low acid is an established fact, so all other factors must likewise be controlled if possible. This situation obtains after surgery as well as it does on medical therapy. Surgery, after all, is not a cure-all for ulcer.

When we discuss the indications for surgery we must bear in mind that surgery is offered as the lesser of two evils, the patient having

arrived at a point where medical management alone does not suffice; either it does not adequately protect the patient's life, or it does not adequately relieve him of symptoms.

Where to draw the mythical line between medical and surgical treatment is difficult in many cases, but certain principles based on results can at least act as guideposts to a proper decision and save the patient from becoming too great a surgical risk or enduring needless symptoms over a long period of time.

Surgical intervention is indicated in duodenal ulcer in cases of perforation, and in certain cases of obstruction, hemorrhage, and intractability under medical management.

Acute perforation with ulcer is recognized by all as being a surgical emergency and is an out-and-out indication for surgery. The incidence of perforation is quite high, occurring in about 10 to 20 per cent of patients who are admitted with ulcer to large hospitals. It is significant, however, that even though most of these patients have symptoms for from one to five years prior to their perforation, only 10 or 20 per cent of these cases have been under previous medical management. In other words, in the face of proper medical care the incidence of perforation is low.

To consider the indications for surgery in

\*Clinical Instructor in Surgery, Western Reserve University School of Medicine, Cleveland, Ohio; former Chief of Surgical Service, Army Air Forces Regional Hospital, Truax Field, Madison, Wisconsin, and Wm. Beaumont General Hospital, El Paso, Texas.

NOTE: Presented before the meeting of the Interstate Postgraduate Medical Association of North America, Cleveland, Ohio, October 15 to 18, 1946.

the presence of obstruction, let us review a case. The patient's history is briefly this. She is thirty-nine years of age and she recently entered the hospital complaining primarily of vomiting. She dates the onset of her symptoms to 1941, at the time of the birth of her last child. At that time she vomited a lot before and after the delivery of the baby. After a period of about two or three months of illness she was relieved of symptoms. Then symptoms recurred, with vomiting and severe abdominal pain. The pain was to the right of the midline in the upper abdomen. The pain was worse after the noon meal and at night and was not relieved by food. Soda seemed to help some. The night pain was extreme and could be relieved only by forced vomiting, which gave temporary relief.

These symptoms lasted for several weeks and then she passed some black, tarry stools, and was relieved of pain. She remained quite well, except for some night pain, until fall. She had another attack which was just like the previous one, and this lasted until she was operated upon in January 1942 for what was thought to be gallbladder disease. The gallbladder was found to be normal and a penetrating duodenal ulcer was found.

WE MIGHT digress for just a moment to dwell upon one point. The surgeon who did the operation had the case referred to him by a very good medical man. The surgeon is a good surgeon. They made an error which is not infrequently made. The patient's history up to this point could very well have been gallbladder disease rather than ulcer, if it were not for her tarry stools. That point in the history was probably overlooked. Cholecystograms, of course, were done before her operation and they failed to fill. It was thought that she had a nonfunctioning gallbladder. I think the point should be made that in the case of active duodenal ulcers, the cholecystogram may be unreliable. If the history is confusing, the patient should also have a gastric series as well as a cholecystogram.

Nevertheless, the abdomen was closed at



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that time and she was placed on a strict medical regimen which made her symptom-free, except for night pain, for about a year. Since then she had recurring attacks coming on usually in the spring and fall, which is quite characteristic. Her periods of relief became progressively shorter and her night pain was almost constant and at times almost unbearable. Vomiting was a prominent symptom. She went from doctor to doctor, and had nothing more than temporary relief.

In June 1946, following severe symptoms which began early in the spring, she was admitted to the hospital and found to have almost complete retention. Her doctor placed her on a medical regimen, and after three weeks she tolerated soft foods. X-rays revealed a deformity of the duodenum but no niche.

On discharge from the hospital, symptoms promptly recurred and persisted until she was again admitted to the hospital in late September. During that time she lost forty to fifty pounds.



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In this case a subtotal gastric resection was done. The duodenal side of the pylorus was found to be markedly scarred and constricted. She has been symptom-free since her operation and should remain so. Her free acid at the present time is absent except after stimulation with histamine.

Some things in this patient's history are worthy of mention. In the first place, vomiting has always been a prominent symptom in her case, and that usually points to an ulcer in the region of the pylorus. Patients who have ulcers close to the pylorus usually do poorly on medical management. She also had a lot of back pain. Back pain in ulcer indicates a penetrating ulcer of the posterior wall of the duodenum. These cases likewise tend to do poorly on medical management. Night pain has always been an important and a very severe symptom in this patient. The fact that night pain persisted even when her daytime pain was relieved indicated that under medical management her night acidity was never under control and she probably also had retention at night.

At the time of her admission to the hospital in June 1946, it could not be definitely told whether or not this patient was suffering from spasm and edema which caused her obstruction or whether she had a cicatricial obstruction. In the light of her recent severe symptoms it very possibly could have been a temporary thing, but in the light of symptoms going back for five and a half years it would seem more likely that it was due to scar.

Usually in patients who vomit a great deal, such as this patient did, the thing that causes the obstruction at first is spasm; then it is probably spasm plus edema; but when it goes over a period of five and a half years it usually is scar because of the frequently recurrent or persistent inflammatory process.

After long-standing obstruction of the stomach most patients run a low acid and do very well after so-called conservative surgical procedures. This is particularly true in patients over fifty or sixty years of age. Their gastric acidity usually is very low. In young patients, however—and you may note that this patient

was thirty-nine—there seems to be a definite tendency for the acid to go back to higher levels after the obstruction is relieved. For this reason I believe that in people in the younger age group, an extensive gastric resection should be done if it is technically not too difficult to do.

To summarize obstruction cases, let us say that all cases of cicatricial obstruction require surgery and that many cases of recurrent obstruction require surgery on the basis that their prognosis under medical management is poor and that eventually they will have to have surgery, so it should be done before they are poor surgical risks. Whereas conservative procedures may suffice for those beyond fifty or sixty years of age with a long history and a low gastric acidity, extensive gastric resection is indicated in younger patients because of the tendency of the gastric acidity to rise after the obstruction is relieved.

TO CONSIDER another indication for surgery, hemorrhage in duodenal ulcer, let us consider the case of a woman sixty years old. She was admitted to the hospital in obvious shock due to hemorrhage. Her bleeding had begun three days before admission, without any warning symptoms of pain or discomfort. She quite suddenly passed a large stool of liquid blood, very dark in color. She also vomited blood. She felt pain and was weak. She perspired freely and was thirsty. She continued to pass black, tarry stools and some liquid stools of dark blood. She absolutely refused to go to the hospital until three days after the onset of bleeding because she had had previous hemorrhages and they had all stopped spontaneously. Sixteen years previously she had bled, apparently quite severely, following some right upper quadrant pain. At that time x-rays were taken and they revealed a duodenal ulcer and also gallstones. She had three more very severe hemorrhages and several minor hemorrhages during the intervening years, with no other symptoms except occasional right upper abdominal pain, which she attributed to her gallbladder since she knew she had gallstones. Her

pain was unrelated to food.

On admission to the hospital she was immediately given a transfusion. Her red blood count was 2,480,000 and her hemoglobin, 34 per cent. Several hours later her red count dropped to 1,660,000, her hemoglobin to 22 per cent.

During a period of forty-eight hours this patient was given over 3500 cc. of blood and 2 units of blood plasma, but her condition became steadily poorer and she died.

Bear in mind that this patient had apparently bled for three days before she came to the hospital. At the time she was first seen by a surgeon she had been too ill for too long a time to justify an attempt at surgery. This opinion was concurred in by two surgeons.

In this case the question is, would surgery have been indicated if the patient had come to the hospital on the first or second day of her hemorrhage? I believe so. In the first place, she had a known ulcer, she had bled before, and the presence of ulcer had been established by x-ray. She did not have cirrhosis of the liver, which would account for bleeding from esophageal varices. She had had a long history of bleeding so that it was quite evident she was not bleeding from carcinoma. The diagnosis was very definitely established. The hemorrhage also was definitely massive. She bled a large quantity. She was sixty years old. In this age group people with severe massive hemorrhage have a mortality of about 33 per cent.

If the case were in the hands of a capable surgeon accustomed to doing gastric resection, with blood available for transfusions during and after surgery, and if the surgery could have been done within a reasonable period, preferably within forty-eight hours, the risk should not have been more than 10 per cent in this patient. However, if a skilled surgeon and the other facilities are not available, the surgical mortality, of course, can approach the mortality of medical therapy.

It is worth pointing out that the fact that this patient had bled before did not protect her from a fatal hemorrhage, though she was quite confident that it would. It should be borne in

mind by us doctors, however, that a fatal hemorrhage can just as well be the first hemorrhage. As a matter of fact, over half of the people who bleed to death, bleed to death at the time of their first hemorrhage from duodenal ulcer. Although immediate surgery in severe massive hemorrhage is indicated in people beyond fifty or so, on the basis of statistics that have been carefully accumulated in large hospitals, it is just as true that patients under forty-five or fifty should be treated conservatively. Death from hemorrhage in the younger age group is not common. This accounts for the fact that most doctors treat hemorrhage from ulcer quite lightly. Many men with extensive practices have never seen a patient bleed to death. After all, most people who bleed from hemorrhages or who have hemorrhages in ulcer are in this younger age group and they do well and should not be operated upon, but we surely should bear in mind that the older patient with sclerotic vessels carries a high mortality with his bleeding, and surgery should be definitely considered.

**I**S SURGERY indicated after recurrent hemorrhage? Let us consider the case of Mr. G. He denies any symptoms until ten years ago. He then experienced rather sharp, cramping pains in the epigastrium, which radiated to the right upper quadrant. The severe pain was relieved by vomiting, which he forced himself to do. Food temporarily relieved his pain. He did not experience night pain. He had no tarry stools and no evidence of blood in his vomitus. He was placed on a diet by his doctor which relieved him of all symptoms within two months. He remained symptom-free for about five years and then experienced pain in his right upper abdomen for about two days, seemingly unrelated to food, and then began to vomit blood. He vomited large amounts of coffee-ground-like material three or four times and also passed three or four black or dark-red, liquid stools. He felt weak and faint. He was soon symptom-free and remained so until his most recent episode. This occurred about one month ago when

he was readmitted to the hospital following an acute hemorrhage. He denies any warning symptoms of any kind, and had no pain during this five-year interval. He has been completely free of any type of pain before or after the onset of his bleeding.

On admission to the hospital his blood pressure was 84/50. He was obviously in shock. He was given 500 cc. of blood immediately and his blood pressure rose to 122/80. Within three hours his pressure had again fallen to 82/40, with a pulse rate of 118. He was restless, he was pale, and he passed a large stool of bright red blood. His blood count was taken again and it was 1,870,000; his hemoglobin was 33 per cent; and his blood pressure fell to 66/40, following which it gradually improved and reached 100 systolic after about sixteen hours in the hospital. There was no further evidence of hemorrhage.

X-rays on his fourteenth day in the hospital revealed a constant deformity of the duodenal bulb with narrowing but no ulcer crater was demonstrable. Colon and esophagus were normal.

This man had had two massive hemorrhages. His last hemorrhage was sudden and without warning. Fortunately, bleeding stopped soon after its onset. Immediate surgery was avoided.

What is the proper course to follow in a case such as this? I believe that he should have gastric resection to avoid the possibility of future hemorrhage. He is fifty-six years of age. With his blood vessels, the next hemorrhage may well be fatal. He had no warning of the approach of this hemorrhage. He has been a good patient; he has followed his diet fairly well, as well as a person can be expected to follow a diet if that old persuader, pain, isn't present. He stopped smoking and he does not drink. There is no reason to feel that there would be any warning before his next hemorrhage.

The mortality rate of gastric resection in this man should not be more than about 5 per cent. Incidentally, gastric resection is almost essential to control bleeding because of the peculiar blood supply around the duodenum. Operations directly upon the duodenum are

hardly satisfactory and do not insure against hemorrhage in the future. In younger patients with recurrent hemorrhage, surgery should be considered more on the basis of intractability than of danger to their lives from hemorrhage. Allen has pointed out that about 20 per cent of patients who have had hemorrhage do poorly on medical management.

To summarize, let us say that patients with severe massive hemorrhage beyond the age of fifty are entitled to gastric resection if the surgeon and the facilities are available, and if the surgery can be done within a reasonable period of time after its onset. Patients under fifty should, as a rule, be treated conservatively and not subjected to immediate surgery. Recurrent severe hemorrhage in any age group is usually an indication for gastric resection.

FINALLY, to consider the problem of intractability to medical therapy, let us review another case. I took this case out of the records of the gastric clinic. In 1937 at the age of 20 this man first noted epigastric pain with a feeling of gaseous distention and a sensation of pressure in the upper abdomen occurring one hour after eating. There was no radiation of the pain and he denied having any night pain. His symptoms for the most part were moderate and occasionally entirely absent.

One year after the onset of his symptoms they became much more severe and night pain began. He began to vomit occasionally. The vomitus put his teeth on edge. He could no longer get even temporary relief with food or soda. He sought medical advice and was found to have a duodenal ulcer about 1 cm. in diameter. He ran a high gastric acidity; by that I mean his free acid was around 90, his total around 120.

After a period of eight months of careful medical management this patient's symptoms were still severe and he showed no improvement on x-ray examination. He was admitted to the hospital and failed to get relief on hospital care. He was therefore operated upon. One-third of his stomach was removed at that

time and a posterior gastro-enterostomy was done. This is the Billroth type of operation. From the surgeon's note I could not be sure whether or not an exclusion type of operation was done, but the ulcer was left; there was so much inflammation that he felt he could not resect distal to the ulcer.

Although the patient got temporary relief from his symptoms, he continued to run a high gastric acidity. There were several tests done; one, for instance, ran 96 free and 120 total. In three months his old symptoms recurred and in another three months he had a severe hemorrhage. He was hospitalized and discharged one month later symptom-free, only to have a recurrence of pain and another hemorrhage. In the next four months he had two more hemorrhages. During this period a possible marginal ulcer was described on fluoroscopy but could not be demonstrated gastroscopically.

Because of the completely unsatisfactory result of his partial gastric resection over a period of approximately two years, as evidenced by severe symptoms, recurrent hemorrhage, and continuously high acidity, he was readmitted, the old anastomosis was taken down, a

high subtotal resection (three-quarters of his stomach) was done. That was done five years ago, and he has since been symptom-free and his acid has remained very low.

This case illustrates the intractability to medical regimen of a few cases of duodenal ulcer. This patient was cooperative and he was treated under a regimen that was satisfactory for most other medical cases.

I have not mentioned the operation of vagotomy because it is in the stage of observation at the present time. It certainly shows a great deal of promise, but it is not well enough established to advocate as a general rule.

A surrealist's conception of Gastric Hemorrhage painted in oil by Clyde W. Geiter, M.D., associate medical director and industrial physician, Frederick Sterns & Co.

Most prominent in the picture is an anemic face, with a look of blankness. The head is surrounded with clouds and bubbles to represent the feeling of lightheadedness, as symptom of the disease. The body is a barrel, half filled with viscera. The heart is seen as a huge watch, ticking life away. In the patient's nose is a Wangensteen tube. On an extension arm a white tray bearing a rubber glove is thrust forward toward the suffering face, as a hope that an operation may bring relief. A syringe for sedative aid is also visible, as is bottle of whole blood, hanging from a tree branch from which icicles drip, and ready for a transfusion.



## Differential Diagnosis of Lesions of the Mammary Gland

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THE first case to be discussed is that of a woman, 74 years of age. She was admitted to the surgical service of the University Hospital in Cleveland three weeks ago complaining of a sore place on her foot. She has had a brownish flat mole on the medial surface of the left foot that caused her no concern until five months ago when it became tender, turned black, and ulcerated.

Her previous history shows that she had an ovarian cyst, right tube, and appendix removed twenty-five years ago. Two years ago the patient noted a small amount of discharge from the right nipple, but this disappeared after two weeks. Recently a bloody discharge from the left nipple has been noted. There has been no associated pain.

The physical examination is unimportant except for the breast condition and the lesion on the foot which has been removed by local excision, cauterization, and skin graft. The diagnosis of the lesion on the foot is melanoblastoma.

We are interested in the breast lesion. It

might be well to say a word about the examination of women for breast lesions. If you are going to do it thoroughly you have to expose both breasts. Note any change of contour, the types of breasts, and any irregularity of the nipples.

This patient's chief and only complaint is that she has a discharge from both nipples. A serous discharge can be expressed from both nipples. There are no palpable masses in either breast on examination. I think it is important to examine first with the arms to the side, and in pendulous breasts to support the breast and gently with a flat hand palpate the entire surface. That first palpation reveals no mass whatsoever in this lady's breast. It is perfectly smooth, normal breast tissue. The same thing is true on the other side.

It is well to ask the patient to abduct the arm, then to flex the forearm and palpate the breast again, because this action lifts the breast and sometimes posterior tumors will become a little more forward and you can feel them if they are small. In the case of this patient we can feel nothing, however. The flat hand in the axilla pressing the skin against the ribs reveals no masses in that axilla. This patient is a case of bilateral watery discharge from both breasts, no tumors present.

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J. STEWART RODMAN

The next patient is 38 years old and was admitted to the hospital complaining of trouble with her right breast. Her present illness began three weeks ago, when the patient felt her right breast itched and she pinched it. She noted serum exuding from the region of the right nipple and areola. The region was bandaged twice daily and bathed in Epsom salts. An eschar would form, subsequently would come off, serum would again exude from the nipple and areola, and this cycle repeated itself approximately three times in three weeks. She had had no previous difficulty with either of her breasts or nipples. The other history is irrelevant. I have examined the left breast and it is perfectly normal.

This patient has a thickened, eczematous condition about the right nipple. The nipple is flattened and is a little retracted. When I cupped the breast I was able to express some serum, a watery serum, not bloody. She has a lesion about the areola of the right breast. This lesion causes itching but no particular pain.

She has not noticed any masses or lumps in her breast at any time. She is married and has two children. Except for this condition, she is perfectly healthy.

Of course, all we can hope to do right now is to discuss the more important lesions—more important because they are more common. I should like to discuss briefly four benign lesions and two malignant ones. The benign lesion, fibro-adenoma or adenofibroma (most people call it fibro-adenoma), is a perfectly recognizable lesion, which presents no difficulty in diagnosis. It is a small tumor distinctly encapsulated; it can be moved freely in the breast tissue, is not attached to the skin, is painful, occurs in women in their twenties, and is about the size of a cherry. At times these fibro-adenomas, particularly in the colored race, take on growth and become very large. If they are fibro-adenomas they remain, as a general rule, benign, so that we have no particular concern about them. I have removed fibro-adenomas in a colored girl who had them bilaterally, one from one side the size of a grapefruit, one from the other side the size of an orange. They do grow much larger than that.

There is another benign tumor called intracanalicular myxoma. It occurs in a little older age group, usually between thirty and forty. It is a definitely encapsulated tumor and can be moved freely within the breast tissue. The overlying skin is not attached. It is a softer tumor than a fibro-adenoma. It has just one potentiality that makes us feel a little more concerned about it than a fibro-adenoma, and that is, at times, and fortunately rarely, it takes on rapid growth and when it does it usually undergoes sarcomatous, not carcinomatous, change.

THE next most common lesion is intraductile papilloma. These intraductile papillomas are classified as benign and yet, in my experience, they are certainly a little bit more than potentially malignant and they may very well be malignant if they occur in women over forty. The one characteristic, pathognomonic thing about them is that there is a discharge



of pure blood from the nipple. You cannot palpate these tumors as a general rule. They are small papillomas growing into the ducts resulting in bloody discharge. Certainly in women over forty, and I should think even over thirty-five, one should not trifle with such a lesion. Do not dismiss it lightly; do not say, "Oh, well, it is benign. We won't do anything about it. We can't feel the tumor; there can't therefore be much wrong with the breast." Those cases should be transilluminated, which means lifting up the breast and with a light transilluminating the breast in a dark room. That will be a great diagnostic help because as a rule it will show a dilated duct where the lesion is. Soft tissue x-ray will also be of help in the diagnosis.

An analysis a few years ago of one of our series of 200 breast cases showed that 6 of those were papillary cystadenomas and of the 6, 4 were malignant when submitted to the microscope, so I cannot look upon these intraductile papillomas or, as they are sometimes called, papillary cystadenomas, with anything but real concern.

The most interesting disease of the breast, including malignant disease, if you please, is the disease called by so many names, but most commonly called chronic cystic mastitis. Chronic cystic mastitis, as a matter of fact, is not a particularly good name because it implies that it is inflammatory in origin. It definitely is not. I think we now know, beyond any reasonable doubt, that it is based on a hormonal imbalance, with stimulation of the pituitary to the graafian follicle of the ovary and in turn to the breast.

In a large percentage of these cases we find an associated pelvic pathology. In a series of 100 cases that we analyzed not too long ago, 55 per cent had definite pelvic pathology.

The clinical picture is rather definitely marked in chronic cystic mastitis. It may be bilateral in 20 per cent of the cases. It is painful; carcinoma is not. (I wish it were; then we would get people at a time when we might be able to do something about it). There are two types. There have been a good many patho-

logical classifications, but time will not permit going into the various classifications of different authors and the reasons for their making those classifications.

#### 132 CASES—RADICAL MASTECTOMIES— RODMAN METHOD

FREE FROM ALL EVIDENCE OF LOCAL, REGIONAL OR DISTANT  
METASTASIS.

Per Cent	Duration, in years
61 .....	3
46 .....	5
16 .....	5-10
6 .....	Over 15

#### 132 CASES—RADICAL MASTECTOMIES— RODMAN METHOD

Per Cent	
53	Axillary metastasis at operation.
23.5	Free from recurrence for 5 years
46	No axillary metastasis at operation
63.5	Free from recurrence for 5 years
2.2	Local recurrences in entire group

THE two important types are, first, that type occurring in young women between twenty and thirty as a very general group, with pain particularly in the premenstrual stage, the pain being referred to the breast, sometimes to the right arm. The patient tells you that she has tender areas in the breast, but does not complain of a definite tumor mass or, as she would say, a lump.

When you come to examine such a breast you will find no definite tumor. You will find—and I don't know of any better way to put it—irregularities of the breast tissue; the breast tissue does not feel smooth; the overlying skin is not attached; the breast is tender to palpation, particularly in the premenstrual stage. The menstrual cycle bears such an important relationship to chronic cystic mastitis and to a thorough understanding of that condition that I only wish we could go into it more deeply. Suffice it to say that one must see these patients in the premenstrual stage, in the menstrual stage, the postmenstrual stage, and the resting stage; one should see such patients once a month in these cycles before one really can decide about some of these cases of chronic

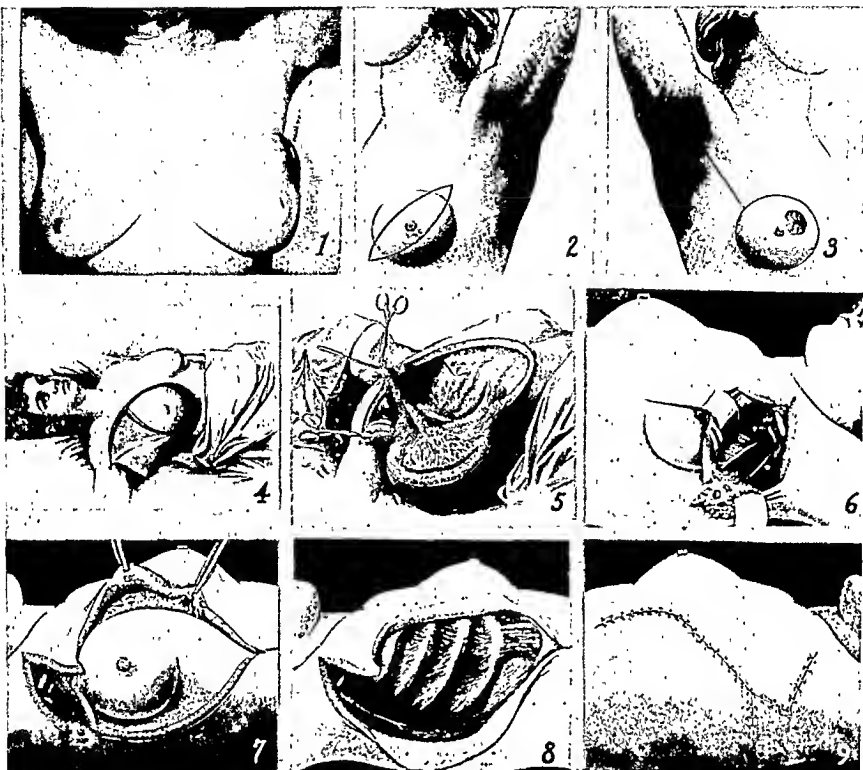


Figure 1. Advanced carcinoma of breast showing growth attached and about to break through the skin.

Figure 2. Earliest operative procedure to remove breast for carcinoma. Elliptical incision used by most operators. Oval incision of Gross.

Figure 3. Gross method showing attempt to remove axillary glands.

Figure 4. Original Halsted method.

Figure 5. Halsted method. Pectoral muscles and axillary contents removed.

Figure 6. Rodman method of radical amputation showing axillary dissections done first.

Figure 7. Incision for removing breast.

Figure 8. Operation complete.

Figure 9. Appearance of sutured wound.

cystic mastitis, because the breast changes astonishingly in those stages. The breast, you know, is in its resting stage from the fifth to the fifteenth day after menses, and then it begins to go through its cycle again.

The mazoplasia, which is the name Cheatle gave the first type, is a benign condition. It is not pathologic. The other variety of chronic cystic mastitis is the dangerous type.

The second type Cheatle calls by an outrageous name that nobody can remember. I will mention it if I can remember it myself—cystiferous, desquamative, epithelial hyperplasia. Nobody is going to use a name like that. It is an epithelial hyperplasia group that usually occurs in women over thirty, whereas the mazoplasia occurs in women twenty to thirty years old. The second type may be malignant. In our own series it was malignant in 15 per cent of the cases we submitted to the microscope. Cheatle says that in his series 20 per cent were malignant when submitted to the microscope.

OF COURSE, the principal problem so far as the breast is concerned now, as it always has been, is carcinoma or cancer. A patient with a perfectly typical appearance of a carcinoma located in the central zone will have retraction of the nipple, with dimpling of the skin, or the so-called "orange-peel" skin. There is a marked difference between the two breasts. You so often hear it said that you must have retraction of the nipple in cancer of the breast. That, of course, is not true. It depends on the location. If it is in the central zone, yes, if it is allowed to remain there long enough.

In early carcinoma, we should, theoretically at least, be able to cure 100 per cent of the cases. Unfortunately, there is no series on record that I know anything about that can show 100 per cent of cures. The best we can show you is 70 per cent, usually 63 to 70 per cent depending on various authors.

When carcinoma has remained in the breast for some years it becomes adherent to the skin, finally ulcerates through, breaks down, and



(Left) Shows usefulness of arms not interfering with ad-  
duction.



(Right) Arms in full extension.

there is usually not only axillary metastasis but metastasis to other regions.

Inflammatory carcinoma, or carcinomatous mastitis as it is sometimes called, is a very malignant type and usually occurs in the puerperium and involves the entire breast. Usually it is rapidly fatal, and so far as my own experience is concerned it is a perfectly hopeless condition with respect to radical surgery.

Another type of advanced carcinoma is the so-called atrophic or withering appearance where the breast tissue has been destroyed finally by the malignant growth which has squeezed out breast and fibrous tissue.

Recurrences should not recur often and I believe the reason they do recur is that in the operative removal en bloc for carcinoma, radical breast amputation, we do not take enough skin in certain types of operation.

X-ray is valuable but not as a preoperative aid. We do so routinely, of course, postoperatively wherever there is axillary metastasis.

Paget's disease of the nipple is cancer of the breast with secondary changes in the nipple; it is cancer of the duct. It was originally thought to be a skin lesion when first described by Sir James Paget in 1874, but we now know it to be, without any doubt, cancer of the ducts with secondary areolar change, with a florid dermatitis and usually a discharge from the nipple and with a thickened, edematous area about the areolar zone.

## Rheumatic Heart Disease in Children

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IN CHILDHOOD there are two main forms of heart disease—congenital heart disease and rheumatic heart disease. Of the two, rheumatic heart disease is the more important. In the first place rheumatic heart disease is encountered much more often than congenital heart disease. Furthermore congenital heart disease representing as it does a congenital anomaly rather than infection, is a relatively static condition. From earliest life one is fairly well able to assess the amount of damage and to know what possibilities the future holds for the child. In rheumatic heart disease, on the other hand, the condition results presumably from an infection which is likely to be repeated often, each bout of infection resulting in more serious damage to the heart. Hence one is never able to write a complete picture of rheumatic heart disease so long as the patient remains alive. In one instance the child may have a single attack with relatively slight damage and go through life with no recurrences and relatively little or no appreciable handicap, while in another instance a first attack may be overwhelming and prove fatal within a few weeks. More common than either of these extremes is the picture of re-

peated rheumatic infections over a period of several years, each one of which is likely to inflict progressive damage on the heart with increasing handicap so far as physical activity is concerned.

Rheumatic heart disease is not an isolated phenomenon. It is only one of several components of the entire syndrome of rheumatic fever. The pathologists inform us that many organs and tissues throughout the body reveal the presence of Aschoff's bodies, including the heart, the lungs, the blood vessels, the brain, and even the skeletal muscles. From the clinical standpoint there are a number of phenomena which have come to be recognized as pathognomonic of the rheumatic infection. These are polyarthritis, chorea, rheumatic nodules, annular erythema, and rheumatic heart disease. When seen in typical form it is generally conceded that any one of these manifestations is sufficient for a diagnosis of rheumatic infection. There are several minor manifestations which are quite frequent but not pathognomonic. These include nose bleed, arthralgia, pallor, slight elevation of temperature, rapid heart action, and anemia.

I now wish to discuss a few cases to illustrate some of the salient points in the behavior of the rheumatic infection.

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Shirley first came to the Children's Memorial Hospital in September 1940, when she was a little less than six years old. She had been perfectly well until ten days before coming to the hospital, when she began to be nervous and irritable. She had been dropping things, had manifested jerky movements, and had developed great difficulty in walking. Finally she was unable even to stand alone. She was unable to feed herself. The mother said that the child was so nervous that she could not sleep or rest. She had been in bed a week before admission. Physical examination at the time of hospital admission revealed a perfectly typical and very active chorea. The child had marked emotional instability and widespread involuntary movements. She had no fever. Her blood count showed no anemia and there was no leukocytosis. The sedimentation rate was 3 mm. in one hour. In other words, there was no evidence either on physical examination or on laboratory findings of the presence of active infection.

During her stay in the hospital, a very short, soft, localized systolic murmur was heard at the apex which was felt to be of doubtful significance. X-ray examination of the heart at this time showed that it was of normal contour and size. All signs of chorea disappeared and the patient was discharged from the hospital after two months. She was then followed in the outpatient department, where it was noted that the slight systolic murmur which had been present had completely disappeared.

The child remained well for eight months, but then she again came to the hospital with symptoms and signs of active chorea. In this instance, however, the story was slightly different, in that three weeks previously she had complained of pain in her ankles sufficiently severe to cause her to limp. It is significant that on the second admission examination of the heart revealed the apex one-half inch beyond the midclavicular line, together with systolic and mid-diastolic murmurs at the apex. It was also significant that x-ray examination of the heart at this time showed 15 per cent enlargement. Furthermore, the sedimentation rate, which had been 3 mm. on the previous

admission was now found to be 16 mm. in one hour (Cutler method). With rest in bed the patient again improved and was discharged from the hospital after a stay of two and one-half months.

ONE month after discharge from the hospital she reported to the clinic with the story that she had had a cold during the preceding two weeks. Examination revealed an inflamed throat but no change in the heart findings. The child was advised to remain in bed at home and to return two weeks later. On returning after two weeks the mother stated that there had been no particular change in the child's condition. She had not complained of joint pains. At this time, however, there was a striking change in the physical examination. The heart was markedly active, the apex thrust was prominent, the systolic and mid-diastolic murmurs previously present were still heard, but there was in addition a diastolic murmur along the left sternal margin typical of aortic insufficiency. Moreover, whereas only three months before x-ray examination had shown the heart to be only 15 per cent enlarged, it now showed it to be 50 per cent enlarged. Furthermore, rheumatic nodules on the right elbow were noted. The patient was again admitted to the hospital.

It might be well to point out that neither joint pains nor chorea were present preceding this latest recurrence of cardiac involvement. There was, however, a history of throat infection several weeks before the new bout of carditis. It should also be emphasized that on this occasion a new valve had become involved, and that—what is much more important—rheumatic nodules had appeared. It is evident that this newest attack was more severe than the preceding ones, and it was necessary to keep the patient in the hospital for a longer period. On this occasion the duration of the hospital stay was five months.

At the time this paper was written it was almost two and one-half years since the child's last discharge from the hospital and she had

remained well since that time. She attended school and was able to exercise moderately.

In summary, this is a very remarkable example of numerous and varied manifestations of rheumatic fever. In the first place, the patient had a pure, uncomplicated chorea. During her first stay in the hospital she had a normal temperature, normal leukocyte count, and normal sedimentation rate. She left the hospital with a good heart. Before her second attack of chorea, however, she gave a history of having pain in her joints. On the second admission to the hospital she showed cardiac enlargement, systolic and mid-diastolic murmurs over the mitral area, and an increased sedimentation rate. Her signs of active infection subsided and she returned home and again seemed to be getting along well. However within about a month she contracted a throat infection which persisted for some two weeks. Shortly thereafter she returned to the hospital and at this time there was aortic involvement in addition to her mitral damage and her heart was much larger than it had previously been. What is more important is the fact that she now exhibited rheumatic nodules. I emphasize the finding of rheumatic nodules because they in themselves are practically always indicative of severe rheumatic infection with serious heart damage. It should also be emphasized that in this one patient we have had four of the five major rheumatic phenomena, namely, chorea, polyarthritis, rheumatic nodules, and rheumatic heart disease. The only one lacking was annular erythema.

By 1944 there had been a period of two and one-half years without any evidence of rheumatic activity. Have we the right to conclude that the patient will remain free of rheumatic recurrences? The long free interval is encouraging. However, in 1944 the girl was only about ten years old, and it is well known that recurrences are frequent at least until the age of puberty. It is also taught that rheumatic fever tends to subside after about a five- or six-year period. Inasmuch as four years elapsed since the first attack we have some right to be hopeful that there will be no further recurrences.

Even though there is considerable cardiac damage, the child is able to attend school and is getting along quite well.

MARION was first seen in our Medical Clinic because of eczema at the age of 21 months. At that time her heart was reported to be negative. She returned several times to the clinic because of eczema and occasional attacks of bronchitis. When seen at the age of 3½ years, definite heart findings were noted. The left heart border was found to be outside the mid-clavicular line and there was an apical systolic murmur loudest at the apex but heard both to the left and over the precordium. There was no history suggesting rheumatic fever and there were no symptoms referable to the heart. There was, however, a history of scarlet fever two months previously. The question then arose as to whether the heart findings were rheumatic or whether the child had a congenital lesion which had been overlooked previously.

The child remained well until five months later, when she came again to the Medical Clinic with the story of having been well until three days previously at which time she developed a cold with fever, cough, and anorexia. She had also been very listless and pale. There was no previous history of chorea or joint pains. Physical examination revealed a moderate degree of dyspnea. The area of cardiac dullness was greatly enlarged, the right border extending to the nipple line. The left heart border could not be made out because the dullness extended beyond the left axilla into the back. The breath sounds were very distant beneath the left axilla and somewhat diminished even at the left apex. Between the lower angle of the scapula and the spine there was exquisite bronchial breathing. A to-and-fro pericardial friction rub was plainly heard both to the left and right of the sternum in the third and fourth intercostal spaces. Because of the loudness of the friction rub no murmur could be made out at this time. X-ray examination revealed that the left border of the heart extended to the left costal margin and the right

border to within about one inch of the right costal margin. The heart shadow was approximately 300 per cent enlarged. The x-ray suggested the possibility of pericardial effusion, but it was impossible to differentiate definitely between pericardial effusion and marked cardiac enlargement.

Now it is well known that in rheumatic pericarditis any great degree of effusion is rare. However, in this case because of the tremendous cardiac enlargement and because we were not sure that the pericarditis was on a rheumatic basis we felt justified in undertaking a pericardial tap. This was done but no fluid was obtained.

The child began gradually to improve, and repeated x-ray examinations revealed that the heart continued to decrease in size. After the friction rub had disappeared the systolic murmur previously described at the apex could again be plainly heard. The child remained in the hospital for four months, at which time she was discharged in good condition but with a considerable degree of cardiac enlargement.

The acute attack of pericarditis occurred in 1935. The girl has been followed in our outpatient clinic since that time. In the meantime she has had her tonsils removed and has had several attacks of bronchitis and one attack of pneumonia. Over this period there has been a distinct change in the heart findings. Whereas at first we heard only a systolic murmur at the apex, she eventually developed a presystolic murmur at the apex together with an apical thrill. She has attended a cardiac school and is getting along well. She has been able to exercise fairly freely.

The interesting feature in this case is that apparently the patient had had rheumatic heart disease without any other rheumatic phenomena present and with an illness so mild that it remained undetected; then some time later she had a very severe attack of rheumatic heart disease together with obvious pericarditis and tremendous dilatation of the heart. It is of further interest that she had no obvious recurrences of her rheumatic fever for nine years.

It is fair to inquire whether we can be sure

that her cardiac manifestations were actually rheumatic in nature. Would it not be equally logical to conclude that her heart condition may have been originally congenital in nature and that her pericarditis was not necessarily on a rheumatic basis? I think that we have definite evidence of the rheumatic nature of her illness. You will note that, as time went on, the findings at the cardiac apex changed and that whereas only a systolic murmur was heard at first, a presystolic murmur and thrill were eventually heard. This we should not have encountered had the lesion been on a congenital basis because congenital lesions are not progressive. I would also like to call attention to the striking contrast in the behavior of the rheumatic infection in the two children you have just seen. In the first, there were repeated bouts of infection over a period of years and practically all the rheumatic phenomena were exhibited; in the second, there were never any known rheumatic episodes except the one severe attack of active heart disease including pericarditis. In 1944 the second child had been free from any known infection for a period of nine years. She was thirteen years old. Under such circumstances I believe that we may have reasonable hope that she will avoid future recurrences and that in spite of a heart already considerably damaged she will be able to get on fairly comfortably.

**R**ICHARD first came to us during 1942, at the age of  $7\frac{1}{2}$  years. According to the history he had had scarlet fever three years previously and had not been very well since that time. He was pale, had nose bleeds, occasional abdominal pain, breathlessness on slight exertion, and occasional pains in the legs. So far as the mother knew he had never had any fever. Physical examination revealed a slightly built, blond boy who appeared to be somewhat pale. His tonsils were small and did not seem to be infected. However, his cervical lymph glands showed a considerable degree of enlargement. The heart was not enlarged on physical examination. Auscultation revealed a distinct although not

very harsh systolic murmur heard best in the second left interspace. This murmur was quite localized in character.

The boy was sent to us because of his heart murmur. Did he or did he not have rheumatic heart disease? It will be noted from the history that he had had scarlet fever three years previously. Scarlet fever has always been looked upon as a frequent forerunner of rheumatic heart disease. Furthermore he appeared rather pale which might be a sign of active rheumatic infection. However, his blood count was 5,880,000 and the hemoglobin 14.75 gm. so even though he appeared pale he did not have anemia. Also, he had had frequent nose bleeds, which are known to be a common occurrence in the presence of active rheumatic infection. Finally, he had had a number of attacks of so-called growing pains which had, however, involved his muscles rather than his joints.

Now it is very obvious that he had had a number of symptoms which are associated with rheumatic infection, namely, scarlet fever, nose bleeds, pallor, and muscle pains. Yet when one reviews these symptoms he is not justified in making such a diagnosis because there is not a single one which can be considered pathognomonic of rheumatic fever. Perhaps the most suggestive one is that of growing pains, yet here again one must not be misled into accepting such pains as evidence of rheumatic fever. As a matter of fact it is the opinion of the majority who have studied this subject most carefully that the so-called muscle pains which children have so frequently are not manifestations of rheumatic fever. It is only when these pains involve the joints that one should look upon them as a rheumatic phenomenon. In other words, I think one must state that we have here numerous symptoms that are often associated with rheumatic fever but no one of which can be looked upon as positive evidence.

Let us now consider the cardiac examination to see whether it will furnish evidence either for or against such a diagnosis. It was stated that in the physical examination there was no cardiac enlargement. Moreover, the x-ray also verified the fact that the heart shadow was

within normal limits. The only finding on cardiac examination was a fairly distinct, localized systolic murmur best heard in the second left interspace. Now I think one may state categorically that this murmur is not due to rheumatic heart disease.

**I**N INTERPRETING the auscultatory findings in rheumatic heart disease, one is greatly aided if he keeps in mind the pathology which is present in rheumatic cardiac invasion. Almost invariably the first valve which is involved and often the only valve which is involved is the mitral. In instances of mitral involvement the murmurs which occur are maximum in the region of the apex. The earliest murmur which is heard after rheumatic invasion is practically always systolic in time. A little later an early diastolic murmur may appear, and still later a late diastolic, or so-called presystolic murmur may become audible. In the instances in which the tricuspid valve is involved the findings are practically indistinguishable from mitral valve involvement. In other words, the murmurs are at or near the apex. The only other valve which is frequently seriously involved in rheumatic heart disease is the aortic.

In cases of involvement of the aortic valve it is true that we have a murmur that is heard above the apex over the body of the heart, but this murmur is diastolic in time, beginning with the second sound rather than occurring in systole. Its point of maximum intensity is usually the third left interspace at the sternal margin. Occasionally aortic stenosis supervenes, but in such instances the murmur is heard high up in the right chest usually at the first and second right interspaces.

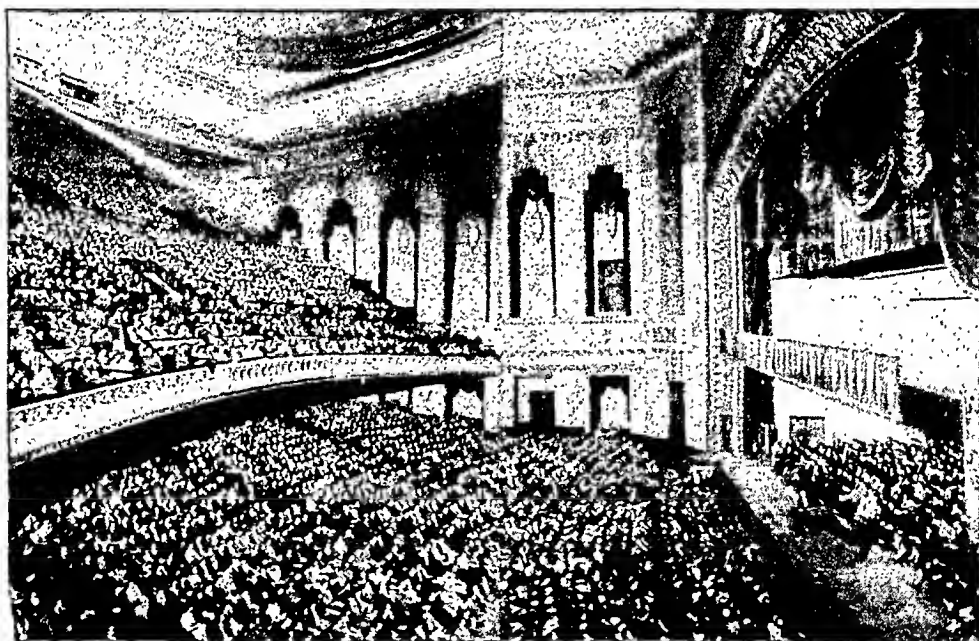
In other words the murmur described in this child does not fit in with the murmurs which arise in the course of rheumatic heart disease. The fact that it is systolic in time and heard in the pulmonary area immediately raises the question of whether it is a so-called functional murmur because it has the timing and location in which they are most frequently heard.

The only important differential diagnosis



here is that of congenital heart disease, because we do encounter systolic murmurs toward the base of the heart in congenital heart disease. In fact, that is their usual location. Therefore we must decide whether this murmur is functional or congenital in nature. The fact that the murmur is not particularly harsh, that it is localized in character, that it is unaccompanied by a thrill, and that there is no evidence of abnormal size or contour of the heart by x-ray all support a diagnosis of a functional murmur rather than one of congenital heart disease.

I think we must still leave the question open as to whether or not this boy has had rheumatic fever. The symptoms are suggestive but not conclusive. The cardiac examination fails to offer any conclusive evidence that there is at the present time any mischief resulting from the rheumatic infection. Hence I believe that the boy may go about his usual activities but that from time to time he should be carefully observed for signs or symptoms pointing to rheumatic fever either in the heart or some other part of the body.



#### LECTURE HALL FOR 1947 ASSEMBLY

Auditorium Theater in which the Clinics and the lectures will be conducted at the 1947 Assembly of the Interstate Postgraduate Medical Association, October 14 to 17, inclusive, at St. Louis, Mo.

## Pre- and Postoperative Fistulas

WARREN H. COLE\*

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I MIGHT first call attention to the fact that there are many other fistulas which are due to disease and trauma, that is, accidental trauma. Of the group caused by disease, we should mention fistulas which result from actinomycosis of the cecum, which are relatively common. They are, of course, spontaneous. Also fairly common are fistulas in chronic cases of terminal ileitis. Tuberculosis of the cecum occasionally breaks down into a fistula. Carcinoma can penetrate the wall of the abdomen as well as the wall of the bowel. Diverticulitis may do the same. Then, of course, we must remember the perianal or perirectal fistulas which are much more common than any of those mentioned previously, but which will not be included in this discussion.

Operative fistulas may be classified as intentional or accidental. We hope, of course, that most all of them are intentional and not accidental. The accidental ones are disagreeable from many angles.

Of the intentional fistulas, colostomies are perhaps the most common. Gastrostomy, of course, is used a great deal for feeding purposes in obstruction of the esophagus—for carcinoma

and stricture. Enterostomy used to be a common operation, particularly in intestinal obstruction. A tube was placed in the small bowel proximal to the obstruction to obtain decompression and thereby protect the suture line. However, this procedure is now practically obsolete.

A bile fistula of several days' duration will follow removal of a T-tube from the common duct after choledochostomy. All these openings will close spontaneously unless there is an obstruction distal to the opening. Some will close even in the presence of an obstruction.

Of the accidental fistulas, so-called fecal fistulas are probably the most common; they are usually due to the accidental placement of a stitch through the bowel during closure of the peritoneum. On other occasions, small tears may be made in the wall of the intestine; if they are not observed and repaired, a fistula or fatal peritonitis may result. When using interrupted through-and-through sutures for closure of the abdomen, the suture which may protrude into the abdominal cavity may cut through the wall of the intestine three or four days later.

Urinary fistulas can develop from trauma, including the use of radium. Duodenal fistulas are perhaps the most serious of all.

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## COLOSTOMIES

A few words about colostomies themselves. They are of two or three types. The single-barrel colostomy which results from the so-called Miles abdominoperineal resection is most commonly encountered at this time. However, when we do a radical Mikulicz resection of a bowel, that is, a stage operation, we commonly bring up two loops together and prepare to crush them later with a crushing clamp. This procedure of bringing two loops out together is a poor one for a permanent colostomy because of the tendency for development of herniation or prolapse of the proximal loop. If the operation chosen makes it necessary to bring out two loops and the colostomy is to be permanent, the loops should be separated by a layer of peritoneum, fascia, and skin as in the first stage of the Lockhart-Mummery operation. This prevents herniation and is more desirable than the double-barrel colostomy with loops adjacent; but from the standpoint of function and care, this is not as desirable as the single loop of the Miles operation.

At first the thought of a colostomy is very depressing to the patients. They immediately say they think they would rather not have the operation. However, after you discuss the procedure with them and tell them about the experiences of other patients, they become adjusted very rapidly, and with a proper psychologic approach you can convince those patients that the colostomy is not going to be such a tremendous load as they thought it was. But a colostomy does require experience in its care. The physician must instruct the patient how to take care of it. He should explain how to irrigate the colon, and suggest that they irrigate it once a day, in the morning, and under ordinary circumstances they will have no more movements throughout the day. One should discuss diets with them, because large amounts of raw, coarse vegetables may cause diarrhea, which will keep them at home and keep them out of society because of the constant leakage. Emphasize the necessity of regularity of the irrigation, although occasionally some



WARREN H. COLE

patients actually do not have to irrigate the bowel. Usually, however, irrigation is necessary.

The type of dressing must also be discussed with the patient. Discourage cups; they are obsolete and more than worthless. They actually tend to produce herniations and are a nuisance to clean. The required dressings consist of nothing more than a few layers of gauze over the colostomy, and fixation of this pad with a cloth belt. Odors can be controlled a bit better by wearing a thin rubber pad over the gauze. Such rubber belts are made and sold commercially. Activated charcoal given in enteric coated capsules is effective in controlling odor.

As an example of colostomy for carcinoma of the rectum, which is perhaps the most common operative fistula, we have the case of a woman 47 years old who entered the hospital complaining of pain in the rectum of three months' duration. This was accompanied by constipation. The pain persisted and she went

to a physician who examined her and found a mass in the rectum; she was then transferred to the Illinois Research Hospital. On examination she did not appear acutely ill. She was fairly well nourished, whereas many of these patients with carcinoma of the rectum are poorly nourished. Her good condition is explained by the fact that her symptoms were of very recent origin. It is very unusual, for us at least, to have patients with carcinoma of the rectum come in for medical care with such a short history.

Her physical examination was negative except for her rectum and a blood pressure of 188/116. The rectal lesion was about 3 cm. in size and located on the anterior wall of the rectum. This was a bit tender but was still mobile, indicating that it was operable. A biopsy was performed and the diagnosis of adenocarcinoma was confirmed. A Miles or combined abdominoperineal operation was performed.

DR. COLE: What was the chief symptom that you complained of before operation?

PATIENT: I had a terrible pain in my lower bowel and I went to a doctor and he discovered an ulcer. It was very, very painful. I couldn't have endured it much longer. It was just something that had to be taken care of.

DR. COLE: Were you constipated at that time?

PATIENT: Yes, I began to get constipated in February.

DR. COLE: Remember, of course, that many of these patients will shift over to a diarrhea. That is a bit off the subject, however. I want to discuss the colostomy in more detail. We told you about irrigation of the colostomy; at first was this quite troublesome to you?

PATIENT: No, I had no trouble at all with the irrigation.

DR. COLE: It isn't much of a bother now?

PATIENT: No. I do it every morning, and I take a pad and put it on and then a little gauze belt to hold it in place.

DR. COLE: And then you have no more leakage throughout the day except perhaps occasionally?

PATIENT: Well, I ate some tomato soup the

other day, and occasionally I would have a little leakage, but outside of that I have no trouble at all.

DR. COLE: If you ate a lot of raw salads, would that cause more leakage?

PATIENT: I haven't tried that. I have been trying to stay closely to my diet.

DR. COLE: That illustrates the point I mentioned. You have to give the patients a diet and tell them that if they do break the diet to do so gradually, because it is apt to create a loose stool; that, of course, is very undesirable.

You will note that this patient had very little trouble at any time with her colostomy; apparently she approached the experience with a very fine psychologic attitude and did not have to go through a period of several weeks of wondering whether or not she would be better off in a long box. She never had that emotional slump at any time.

#### GASTROSTOMIES

Gastrostomies are performed in one of two or three ways, depending upon the case and depending upon the purpose of the gastrostomy. If a patient has an inoperable carcinoma of the esophagus, and is a poor risk, and you expect a fatality reasonably soon, a Witzel type of gastrostomy will be the procedure of choice; however, if you expect the patient to have a long life expectancy, as when gastrostomy is performed for a stricture of the esophagus, the Witzel operation is not very desirable because it leaks secretions and food almost constantly. Under these circumstances, the patient has to wear bulky dressings. The discharge not only is irritating to the skin, but has a foul smell, and is therefore quite undesirable. You avoid this by doing either a Janeway or a Spivack type of gastrostomy. Both of these have a tube flap constructed from the wall of the stomach and brought outside for feeding purposes; in the Spivack gastrostomy a valve is made at the lower end which prevents leakage more effectively than the Janeway tube.

In the Janeway or Spivack operation, a catheter is inserted through the tube for feed-

ing; it is removed after the liquid meal has been given. In the Witzel operation, the catheter must be worn at all times. If it is removed, it may be difficult to reinsert it; more than once attempts to reinsert these catheters after a Witzel operation have resulted in separation of the stomach from the abdominal wall with injection of liquid into the peritoneal cavity. In the Janeway or Spivack operation, the patient can readily insert the tube himself and without danger.

Also remember that if you are doing the gastrostomy for a stricture of the esophagus and want to get up through the stomach with an esophagoscope to dilate the stricture, you have to bring the tube out at an angle so that you can put your esophagoscope up into the stomach in the direction of the cardia.

#### ENTEROSTOMIES

As I remarked before, enterostomies were originally very popular and were performed proximal to intestinal anastomoses with the purpose of preventing distention, but they have become almost obsolete because of the improved gastric and intestinal decompression obtained by the Wangenstein technic.

**I**N THE first place, these enterostomies are a bit dangerous; they cannot be performed without an occasional fatality; the omentum must be placed between the intestine and parietal peritoneum around the place where you have anchored the intestine to the abdominal wall and surrounding the catheter; the sutures must be placed correctly lest they tear out and result in a leak inside the abdominal cavity. Such an accident might result in a local abscess, or, worse than that, generalized peritonitis.

Enterostomies are still used occasionally by some surgeons for the purpose of feeding; a loop of jejunum distal to the gastrojejunostomy in a gastric resection is attached to the abdominal wall and a tube placed in it at the termination of the operation for feeding purposes.

It seems to me to be much more simple to use an Abbott-Rawson tube, which has a two-lumen conduit in a single tube. One lumen is perforated about 10 inches from the end of the tube for decompressing the stomach. The end of the tube is placed in the jejunum. Inserting this tube allows us to decompress the stomach and at the same time feed the patient through the end of the tube placed in the jejunum. The tube is removed on the fourth or fifth post-operative day, when active feeding can usually be begun.

We are utilizing this procedure in all malnourished patients upon whom we perform gastrectomy. In well-nourished patients the need for this simultaneous decompression and feeding is not so great. However, it appears to me to be a very sane procedure to adopt as a routine because such patients cannot take and assimilate much food by mouth for four or five days, and intravenous alimentation is inadequate. We surgeons must admit that we have been guilty, too often, of starving our patients postoperatively. This is inexcusable and must be stopped. Patients upon whom we have performed a serious operation need calories just as badly as a soldier needs calories or ammunition to fight a war. Why not give them these calories to help them carry the load we have inflicted upon them? We can do this fairly simply by feeding them through the Abbott-Rawson tube. This does not load down the stomach, and puts the food distal to the anastomosis where it puts no load on the suture line.

#### BILIARY FISTULAS

Such fistulas are, of course, common because whenever a stone is removed from the common duct, a T-tube is usually inserted and removed two or three weeks later, thus resulting in a temporary fistula. It is true that some surgeons sew up the opening in the common duct. I have done so only occasionally—primarily when dilatation was pronounced.

When a T-tube is placed in a common duct following removal of a stone, certain routine

procedures should be adopted in the care of the patient. I personally do not recommend leaving this tube in longer than two weeks. I believe that after the inflammation in the terminal end of the common duct incident to the operation has subsided, the tube can be taken out. After about ten days we clamp the tube for about an hour a day, and increase this clamping each day until the patient is able to tolerate the tube being clamped for a period of eight or ten hours. If it is painful, it usually means that there is a mild obstruction, suggesting of course that the tube should not be removed at this time. One should wait a few more days, watching the stool for bile and waiting until the tube can be clamped without pain. Unless there is obstruction, these fistulas will not drain longer than a few days after removal of the tube. The cause of obstruction may be either (1) residual stone, (2) local pancreatitis, (3) pancreatitis of the fibrosing type, (4) carcinoma of the head of the pancreas, or (5) a stricture. Unfortunately, strictures are too often traumatic in type, but they can be purely inflammatory and not related to the operation.

Occasionally a biliary fistula results from slipping of the ligature on the cystic duct. Although this may drain profusely for several days, it invariably closes within several days. On other occasions, following cholecystectomy, a biliary fistula will develop from the section of anomalous hepatic ducts connecting the gallbladder with the liver bed. These likewise close spontaneously within a few days.

WHEN the gallbladder is drained a fistula is naturally created; ordinarily it will close within a few weeks. Occasionally this fistula is persistent and does not close. When it is persistent it usually means that there is an obstruction in the cystic or the common duct. Obviously, at the time of operation one should examine the common duct in every case and remove all stones present. If white bile is present in the gallbladder at the time of operation, a diagnosis of obstruction of the cystic duct is almost always justifiable. If a cholecys-

tomy is performed under such circumstances it will not close; therefore, the gallbladder should be removed unless the patient is acutely ill indeed. We don't do very many cholecystomies any more, largely because we learned that the inflammation accompanying cholecystitis of this acute type is not bacterial but is primarily chemical; cholecystectomy in such cases is followed by surprisingly little reaction from the standpoint of infection.

#### PANCREATIC FISTULAS

This group is most commonly observed following resection of the head of the pancreas. At the present time I do not know whether we should transplant the cut end of the pancreas into the intestine following resection of the duodenum and head of the pancreas, or whether we should ligate the pancreatic duct and close over the cut end without transplantation. There is not complete agreement as to how much dysfunction results from ligation of the pancreatic duct, thus preventing external secretions from entering the intestine. Such patients do not have a lot of trouble, but they do have some. They are apt to have a fistula at least for several weeks; it is possible that as time goes on we shall routinely transplant the stump of the pancreas into the intestine and thereby eliminate the pancreatic fistula.

Fortunately, the secretions draining from the pancreas are not very irritating in themselves, although the skin does become red, irritated, and somewhat painful at times. Such fistulas always close spontaneously, but before doing so will alternately close up for a few days and break open. Frequently the patient complains of pain and distress while the fistula is closed and he gets relief when it is opened.

The digestive disturbances accompanying pancreatic fistulas consist of dyspepsia, diarrhea, and fatty stools; the stools are bulky, and if the diarrhea is very pronounced the patient will lose weight and show evidence of malnutrition.

This particular patient, who had a resection of the head of the pancreas for carcinoma,

illustrates that point. Do you still have this leakage on your dressing?

PATIENT: Yes.

DR. COLE: Is it getting any better than it was?

PATIENT: Not much better.

DR. COLE: First, I will set forth the important data in his history. He is 59 years old. He came in complaining of pain in the abdomen of a few weeks' duration, with chills and fever. He was jaundiced for three weeks and had clay-colored stools; his appetite was poor and he had lost 15 pounds; malaise and weakness were pronounced. At the time he came in he had a high fever in the afternoon, dropping down to normal by morning; the diagnosis of suppurative cholangitis seemed quite obvious. We thought he probably had a carcinoma of the head of the pancreas in spite of the fact that he had a suppurative cholangitis, which ordinarily does not occur in carcinoma of the pancreas; it usually occurs when you have obstruction of the common duct by stone.

As an emergency operation, we had to drain his common duct, whereupon his fever and chills stopped and his jaundice lessened. We went ahead and resected the head of the pancreas for the carcinoma, including the duodenum, in two stages. It was done in two stages because he had been so ill with his suppurative cholangitis.

The operation was performed in the latter part of May 1944. You say that the drainage is still present?

PATIENT: It is still draining.

DR. COLE: He doesn't think there has been much decrease. Does it irritate your skin?

PATIENT: Very much.

DR. COLE: Since the operation this patient has had some nutritional disturbances. He developed a rather pronounced diarrhea of the steatorrhea type, whereupon he lost some more weight and developed a hypoproteinemia, requiring hospitalization to bring his proteins back up. His malnutrition is in good control now, but he still has the fistula.

I have not seen, in fact I do not think I have heard of, one of these pancreatic fistulas which persisted permanently. This one has been pres-

ent four months. Most of them will have disappeared by this time.

The patient's skin is covered with aluminum powder which protects the skin from irritation. However, the irritation is mild and there is no evidence of digestion of the skin as in a duodenal fistula.

#### DUODENAL FISTULA

This is a serious type of fistula which tends to digest the skin and subcutaneous tissue. It taxes our judgment and knowledge to the utmost in endeavoring to save the patient and to get the fistula to heal. Unfortunately it commonly results from accidents during the operation; the duodenum is either torn inadvertently or a clamp is put on it and the consequent gangrenous area breaks down later, thus resulting in a fistula. Leakage of the duodenal stump following gastrectomy commonly results in a duodenal fistula. Probably the chief factor in this severe digestion is the activation of the trypsinogen of the pancreas by the enterokinase of the intestine.

WHAT can we do to protect the skin from this secretion? One should first try to apply something protective over the skin around the fistula. Numerous agents including kaolin, liquid latex, charcoal, zinc oxide, etc., have been recommended but none is entirely satisfactory. Neutralization of the ferments by irrigation with an acid solution has been suggested. Aluminum powder and aluminum ointment are more effective but not entirely satisfactory. An ointment made of aluminum powder, zinc oxide, and petrolatum, ounces 3, 6, and 8, respectively, (Thorstad) is fairly effective. The most effective procedure is suction, which was introduced by Cameron in 1924 or 1925. The tract is catheterized by a small tube or catheter and suction applied to this tube; if you keep the secretions out of the wound you will get no irritation of the skin and over half of them will heal spontaneously after several days or a few weeks. However, as I stated, this

is the most dangerous of all fistulas and fatalities will occur in a large percentage of them.

#### FECAL FISTULAS

No doubt the most common accidental fistula is the fecal type developing five to ten days after laparotomy. As stated previously, the most common cause is injury to the bowel; this injury may actually be an undetected, and consequently unrepaired, laceration, or may be the result of application of a suture in the wall of the bowel during closure of the abdomen. On other occasions a suture line in some type of intestinal anastomosis breaks down. Explanations for the breakdown of a suture line are numerous indeed, and include such errors as too deep, shallow, tight, or loose, application of the suture, impairment of blood supply, tension on the suture line, and obstruction distal to the anastomosis, the latter of which may cause a breakdown even in the presence of perfect technic. Naturally the wound will become acutely infected when the fecal fistula develops across it; it may have to be opened widely for drainage.

No radical treatment is indicated for the fistula in its acute stage. After the infected wound clears, most of the fecal fistulas will close spontaneously, although some may drain for months. If drainage persists after seven or eight months, it should be assumed that operative repair will be necessary. However, I wish to emphasize very strongly that no operative repair should be undertaken until it is proven by barium enema, etc. that an intestinal obstruction distal to the fistula does not exist.

Operative repair must be radical. Dissection of the sinus and ligation at the margin of the intestinal wall rarely is successful. Occasionally the fistulous tract leading into the intestine will be so narrow that its base can be inverted into the lumen of the bowel with a couple of purse-string sutures. More commonly, it will be necessary to resort to resection and some type

of intestinal anastomosis. Sulfasuxidine should be given to the patient for four or five days before the operation. Postoperative intestinal decompression will be indicated in all cases. If the fistula is located in the large bowel and a resection is necessary, a Mikulicz resection will usually be satisfactory; if a primary anastomosis is performed, it may be necessary to do a tube colostomy proximal to the anastomosis for decompression.





# EDITORIALS

## POLIOMYELITIS SEASON

**D**URING 1946 apparently more cases of poliomyelitis occurred in the United States than in any previous year with the possible exception of 1916. Although there is great variation in the frequency and average severity of poliomyelitis from year to year, a definite cyclic pattern has not been determined. The worst year recorded prior to 1946 was 1916, but there is insufficient evidence to indicate that a particularly severe poliomyelitis season occurs every 30 years!

At the time of writing, it is impossible to tell whether 1947 will be "good" or "bad" for this disease. In most of the years of high poliomyelitis incidence the spring has shown isolated areas of early outbreaks, usually in the South. Apparently there has not been much of this in 1947.

Regardless of the frequency or over-all severity of the disease this year, it is inevitable that there will be many cases of poliomyelitis. The mode or modes of spread are still matters of some dispute; there is, nevertheless, some evidence that person to person contagion is possible, at least during the early phase. Perhaps it is safe to say that there is slightly more evidence for this method of contracting the disease than there is for sewage pollution or insect vectors or any other single etiologic theory.

Until the method of spread has become established, however, the physician is in the position of taking a middle course in cautioning avoidance of direct sources of infection but re-

sisting the hysteria which is all too easily aroused. He must continue to recognize the fact that in spite of the frequent disastrous consequences of poliomyelitis, it is a comparatively rare disease—and the public should understand this too.

The ideal course of treatment is also still controversial. Adequate controlled studies of present methods of treatment with an impartial evaluation of the results is needed so that all victims of the disease can be given that form of treatment which can be shown to be superior. Controlled studies of the effects of treatment have been difficult to attain and evaluate. Consequently unanimity of opinion has not yet been achieved.

## THE ARTHRITIS PROBLEM

**P**ROGRESS in solving the arthritis problem over the last ten years has been greater than is generally appreciated. To a large extent this comes from the splitting off of specific types of arthritis and the recognition of the importance of differential diagnosis. This means not only that more kinds of arthritis due to bacteria, such as pneumococcal arthritis and gonococcal arthritis, are recognized as such, but also that more are effectively treated by chemotherapeutic agents or antibiotics. It also implies that osteoarthritis, or degenerative joint disease, is now generally recognized as being primarily noninfectious in nature. Therefore this type of arthritis is correctly and more frequently treat-

ed in an entirely different manner than is rheumatoid arthritis.

Rheumatoid arthritis is the variety of joint disease at which the greatest efforts are being aimed to elucidate the etiologic factors, the pathogenesis, and to develop rational treatment procedures.

Most features of rheumatoid arthritis indicate some kind of chronic infection, though if this is true the specific agent, or agents, have not yet been identified. Much has to be learned also concerning the pathogenesis of this disease, though research workers throughout the country appear to be devoting more and more time to this subject. Therapy is, of course, an ever present problem, with constant attempts to weigh the relative value of non-specific and allegedly specific lines of activity.

As was brought out at the recent meeting of the American Rheumatism Association in Atlantic City, some of the commonly employed treatments for rheumatoid arthritis consist in making the patient sicker than he was before. If the patient becomes sick enough and gets

better, the arthritis may also improve. This is perhaps an unduly cynical point of view, but, nevertheless, when one considers, for example, the use of gold salts in the therapy of rheumatoid arthritis, it has much to justify it.

Few problems in medicine are more pressing than the adequate treatment of rheumatoid arthritis and the prevention of the terrible deformities which all too often result in spite of any form of treatment tried. In the conquest of this important variety of the arthritides, research is all-important. The exchange of ideas and the reporting of research permitted by the renewed annual meetings of the American Rheumatism Association should further and accelerate the solution of these problems.

## EARLY DIAGNOSIS OF PSYCHOSES IN CHILDREN

THE prognosis in mental disease, just as in many physical diseases, often depends upon how early in the disease the diagnosis is estab-

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lished and treatment initiated. However, there are obstacles to early diagnosis of mental diseases, not the least of which is the fact that many mental disorders have their origin in childhood. This in itself is not so important, except that most pediatricians have little if any training as psychiatrists. For this reason, the recent report by Bradley of the behavior characteristics of schizophrenic children should be of especial interest not only to pediatricians but also to the general practitioner.

An investigation of the behavior characteristics of 14 children diagnosed as schizophrenic revealed that these children exhibit eight especially prominent characteristics. In the order of their frequency and apparent importance they are:

1. Seclusiveness.
2. Irritability when seclusiveness was disturbed.
3. Daydreaming.
4. Bizarre behavior.
5. Diminution of personal interests.
6. Regressive nature of personal interests.
7. Sensitivity to comment and criticism.
8. Physical inactivity.

These traits were found to be diagnostically significant as early as the fourth year of life, and evidences of maladjustment usually were noted by the second year. While a well substantiated diagnosis of schizophrenia in childhood ordinarily carries a serious prognosis, it is nonetheless true that early diagnosis can bring about a salutary elimination or reduction of factors which intensify the child's fundamental maladjustment. Obviously, therefore, a thorough study of Bradley's work is indicated for pediatricians and other physicians who have children as patients.

## THE A. M. A. AT ATLANTIC CITY

THE recent centennial session of the American Medical Association held at Atlantic City broke all records for meetings of its kind. Attendance was over 15,000 registered fellows: symposia, general scientific meetings and the

section meetings were almost universally well attended. The scientific material presented was of high quality and wide interest.

Outstanding among the features of the session were the scientific exhibits. These exhibits invariably present in graphic form many of the latest developments in different branches of medicine. This year they were both larger in number and exceptionally wide in scope. The exhibit on congestive heart failure by Burch and Reaser of Tulane University School of Medicine, for example, illustrated the use of radioactive sodium as a means of studying physiologic and pathologic processes. This opens a new field of usefulness for the radioactive isotopes. This exhibit demonstrated that there is a much more prolonged retention of sodium ( $\text{Na}^{22}$ ) in congestive heart failure than there is in a normal person.

The teaching possibilities of exhibit material were well illustrated by an exhibit on the use of models in cancer. This was prepared by Goldman and Belsie. It included the use of life-size medical sculptures in full color showing varieties of neoplasms. The parts were interchangeable and were made of different consistencies of rubber to permit life-like palpation. Probably this technic can be extended to many other types of lesions when the actual patients are not available.

The special exhibit and demonstrations on fractures has been a popular feature of the A.M.A. scientific exhibits for many years. The popularity of these exhibits, as well as the special exhibits on physical medicine and the question and answer conferences on diabetes and cardiovascular diseases was reflected by the high attendance.

Although the scientific exhibits and other features of the annual A.M.A. sessions furnish unexcelled sources for keeping up with the progress of medicine, the size of these meetings has become so great that the problems of lecture facilities, floor space, and housing have become increasingly complex. Also the enormous number of lectures, conferences and exhibits is so overwhelming as to cause a feeling of bewilderment.

# This Month in Medicine

## ABNORMAL PROTEIN IN THE BLOOD

WHILE suffering from various diseases, the patient has in his blood stream proteins which are not present under normal conditions. These proteins have been isolated and crystallized. In the past this protein material, C-reactive protein, has been thought to be related to the pneumococcal C polysaccharide.

However, in a recent communication, McCarty has suggested that this relationship is fortuitous—that the C-reactive protein is a separate entity. Furthermore, it is not an immune antibody, as one might expect to find in conditions of disease. For C-reactive protein has no specificity for any inciting agent of the disease. Further, it appears in the acute stage, and disappears during convalescence. And it is in the albumin rather than in the globulin fraction of the plasma.

These findings have interesting implications and have initiated considerable speculation as to the origin and function of this material. Apparently, the regular appearance of the C-protein, or some similar material, is present in disease processes of noninfectious origin. One investigator, for example, found evidence of the existence of C-protein in the blood of six patients with myocardial infarction. Thus, the appearance of this and similar materials seem more or less a general phenomenon, characteristic of pathologic processes.

### SUGGESTED READING

McCarty, Maclyn: The occurrence during acute infections of a protein not normally present in the blood. *J. Exper. Med.* 85:491, May 1, 1947.

## DIAGNOSIS OF GONORRHEA

FEW practitioners are aware of the limitations of the laboratory in determining whether a woman has or does not have gonorrhea. Yet cor-

rect diagnosis is a matter of first importance. It has legal and social, as well as public health value. Nevertheless, most communities require only a clinical judgment, supported by almost any sort of laboratory evidence. Recently, King has demonstrated that these methods do not suffice to assure public and patient that she is free of gonorrhea.

Over 6,100 smears and 3,200 cultures were taken from 598 women in Cincinnati. They were studied by the City Health Department, whose laboratory is probably better than average but which has the ordinary diagnostic facilities found in most laboratories—that is, nothing fancy or unusual, nothing that would make the data significantly different from those taken in the usual clinical laboratory.

In this series, a single smear missed 59 per cent and a single culture missed 38 per cent of the infected cases. However, 3 smears and 3 cultures missed only 0.2 per cent. The cultures were 1.7 times as accurate as the smears for diagnosis. But in detecting treatment failures, the two methods were of equal accuracy. Three smears and 3 cultures during the ten days after treatment missed 8 per cent of the treatment failures. King suggests that the minimum effort for determining a cure should be a succession of smears and cultures over a period of two months.

### SUGGESTED READING

King, A. G.: An evaluation of the criteria of diagnosis and cure of gonorrhea in the female. *Am. J. Obst. & Gynec.* 53:829, May 1947.

## PERSONALITY AND THE DIET

WITH the development of more reliable tests for the measurement or appraisal of personality, several novel problems for investigation have appeared. Not the least important of these has been the relation of diet to personality.

Last year, Brozek and his associates reported

their investigation of normal young men who were maintained on restricted intakes of vitamin B-complex. Under these restricted dietary conditions, the men showed symptoms of personality deterioration long before any changes in their physical well-being could be observed. Depression, hysteria, loss of spontaneity, and increase in tension were commonly observed. When their diets were again normal, their personalities correspondingly returned to normal.

Recently, investigators at the Office of the Surgeon General, U. S. Army, and Northwestern University Medical School have, in a measure, confirmed these findings. Five subjects, during a period of restricted intake of vitamin B and protein, showed personality changes, usually in the direction of hysteria, hypochondriasis, and depression. Regression occurred when the initial normal diet was restored.

These results, if repeatedly confirmed, can be of considerable social, as well as medical, significance.

#### SUGGESTED READING

Brozek, J., et al.: A study of personality of normal young men maintained on restricted intakes of vitamins of the B complex. *Psychosomatic Med.* 8:98, March-April 1946.

Henderson, C. R., et al.: Changes in personality appraisal associated with a restricted intake of B vitamins and protein. *Am. J. Med. Sc.* 213:488, April 1947.

### REGIONAL INJECTION OF PENICILLIN

**D**EBILITATING and painful phlegmons of the nose and throat have been found to respond quickly to local injection of penicillin made directly into the lesions. The technic is relatively new because, in the past, antiseptics could not be so employed. Not only were they tissue poisons, but there was actual danger of spreading the infection.

Penicillin, however, is not a tissue poison; and experience indicates that infections are not spread

by injecting penicillin directly into infected areas. Obviously, therefore, penicillin may be used in a manner more or less peculiar to itself. It may be placed in immediate contact with the offending organism.

Three years ago Peck injected with penicillin multiple furuncles that occurred on the back of a diabetic woman. Regression was complete and rapid. Similarly, Otten injected furuncles with mixtures of penicillin and procain hydrochloride; and Rose and Hurwitz developed an interesting technic of injecting the whole region in which the furuncles occurred. Felon, carbuncle, perianal infection, cellulitis, and other infections yield to treatment.

Local penicillin injection has now been applied to phlegmons of the nose and throat. Gettes treated by direct penicillin injection 26 consecutive otolaryngological patients. Response was immediate in most cases. Of 17 patients with peritonsillar phlegmon, 9 recovered within a day, and all had recovered within four days. Peritonsillar patients would be drinking comfortably and taking a soft diet within twenty-four hours after injection; and they would be eating solids within forty-eight hours. Aside from these favorable responses, the practice has merit because it requires the minimal amount of surgery.

The penicillin was administered usually in doses of 50,000-100,000 units. Seldom was a total of more than 200,000 units required.

#### SUGGESTED READING

Peck, F. B.: Penicillin, with special reference to its use in infections complicating diabetes. *Am. J. Med. Sc.* 208:581, November, 1944.

Otten, A. J.: Penicillin and procaine hydrochloride. *J.A.M.A.* 128:910, July 21, 1945.

Rose, D., and Hurwitz, D.: The regional injection of penicillin in local infections. *New Eng. J. Med.* 234:291, February 28, 1946.

Gettes, G. N.: Regional injection of penicillin in phlegmons of the nose and throat. *Eye, Ear, Nose, and Throat Monthly.* 26:273, May, 1947.

R. W. C.

# Consultation Service

This special consultation information service is offered as a regular monthly feature of *Postgraduate Medicine*. Readers are invited to call on this Service for answers to difficult medical problems from members of our Editorial Board best qualified to help. Each question will be answered by mail and those of general interest will be published each month. Address all communications to Consultation Service, *Postgraduate Medicine*, 512 Essex Building, Minneapolis 2, Minnesota.

## EPIDERMOPHYTOSIS

*QUESTION: What is considered the best treatment for epidermophytosis and other skin fungous infections? Are foot baths in common shower rooms still considered of value? If so what chemicals are used?*

M.D.—Kansas

*ANSWER:* Recently the fatty acids, undecylenic, and propionic have been used extensively in epidermophytosis and other skin fungous infections. These newer measures have not been found any better than older antifungous agents, as salicylic acid, sulfur, mercury, and chrysarobin. The former, however, are nonirritating, have very low sensitizing potentials and can therefore be used in all types of fungous infections of the skin. The prophylactic foot baths in shower rooms are now considered of no value in the prevention of dermatophytosis.

## SUNBURN OINTMENTS

*QUESTION: I understand that the armed forces developed some ointments to prevent the sun's rays from causing burns. Have these been used in any diseases characterized by photosensitivity? What is the composition of these agents?*

M.D.—Washington

*ANSWER:* During the war innumerable substances were tried as protective skin coatings for the prevention of sunburn. One of the most satisfactory agents was found to be dark red veterinary petrolatum. This product is not readily available, however, and most unpleasant to use. Ten per cent Salol (phenylsalicylate) in 70 per cent alcohol, or incorporated in an ointment base, has equally good screening properties.

Some of the newer sun filtering agents, as 10

per cent para-aminobenzoic acid in 70 per cent alcohol, or in a cream base, seem superior to the first mentioned agents. These protective measures have been used not only to prevent sunburn but in such conditions as lupus erythematosus, hydroa varioliformis, and solar sensitivities induced by such drugs as the sulfonamides.

## PULMONARY SUPPURATIVE DISEASE

*QUESTION: In a case of pulmonary suppurative disease such as bronchiectasis, in which multiple organisms have been cultured, should penicillin aerosol and streptomycin aerosol be used? Although oxygen is usually recommended, can compressed air be used instead?*

M.D.—Iowa

*ANSWER:* Both penicillin and streptomycin aerosol might be tried. Unless the patient is suffering from oxygen want, compressed air could be used.

## CIRCUMCISION OF NEWBORN INFANTS

*QUESTION: An increasing number of obstetricians are circumcising newborn infants at the time of delivery. Is this a wise procedure? How great is the danger of hemorrhage?*

M. D.—Minnesota

*ANSWER:* It is still considered inadvisable to circumcise newborn infants until one has had an opportunity to observe their progress during their first few days of life. It is at least incautious to circumcise them at birth. Blood dyscrasias may lead to serious hemorrhages; moreover, the clotting-time of an infant's blood changes materially in the first few days of life.

## MALARIA

*QUESTION: A man, 32 years of age, who returned from the South Pacific two and one-half years ago where he had a severe malaria, complains of chills after any unusual exhaustion. I have seen him on one occasion, the chill was mild, and the temperature 99.0° F. Routine blood smear did not reveal any parasites. After adrenalin a thick smear was negative. He has now lived in an area where there is no malaria for two years. How long might he still have malaria? Should he be treated with anti-malarial drugs, and if so in what doses?*

*M.D.—Michigan*

**ANSWER:** The Veterans Administration recommends withholding the diagnosis of malaria in the absence of parasites. In this case a search for another cause should be made.

Malaria may persist for two or three years after the initial exposure. Only patients with malaria should be treated with anti-malarial drugs.

## LOBECTOMY FOR METASTATIC LESIONS

*QUESTION: I have heard that some surgeons have done a lobectomy for a metastatic lesion when the primary had been removed previously. Are there any cases reported in which this has materially lengthened life? If so, in what type of tumors?*

*M.D.—Illinois*

**ANSWER:** A number of cases are now on record in which lobectomy, and even pneumonectomy, have been performed for metastatic lesions in the lung after previous removal of the primary lesion. Although it may be difficult to prove definitely that life has been "materially lengthened" in these cases, there is reason to believe that it has been. Obviously the procedure is justified only when there is reasonable evidence that there are no other sites of metastases. Under these conditions, and especially if the original neoplasm was of a low grade, the operation would seem to be justified. Further justification lies in the low surgical risk which lobectomy and pneumonectomy now carry.

## PERNICIOUS ANEMIA IN PREGNANCY

*QUESTION: Please discuss the treatment of a patient with pernicious anemia occurring during the first pregnancy. What are the danger signs, especially as to the blood count? What dose of reticulogen should be used and how often should it be given? Should iron be administered?*

*M.D.—Wisconsin*

**ANSWER:** It is assumed that the questions refer to pernicious anemia coincidental with pregnancy rather than anemia peculiar to pregnancy.

True anemia should be treated with adequate amounts of liver extract. A reticulocyte count should be taken before starting the therapy, and additional reticulocyte counts obtained on alternate days thereafter in order to note the results of the therapy. Forty-five units of a potent liver extract should be given daily for a period of four days reduced thereafter to 15 units per day. Folic acid may be given with the liver, in the amount of 30 mgm. per day. If an adequate reticulocyte rise is not obtained, the dosage of folic acid may be increased to 100 mgm. per day.

It is well to prescribe 500 mgm. of Vitamin C orally daily during treatment, and if free hydrochloric acid is shown to be absent by gastric analysis, hydrochloric acid should be prescribed. Also, a ferrous sulphate preparation is recommended, in the amount of 30 grains per day.

The maintenance dose of liver extract should be arrived at by experimentation in each case. One should err on the side of overdosage.

The treatment of so-called "pernicious anemia of pregnancy" would differ little from the regime mentioned above, but these anemias seldom respond well to liver, whereas spontaneous recovery is to be expected after delivery. Both folic acid and liver should be given, with an iron compound, and if necessary, transfusion of whole blood.

As to danger signs, any marked anemia with the red cell count below 3,500,000 should cause concern, and be carefully studied as to nature and background of the disorder.

If reticulogen is chosen as the preparation to be employed, its dosage should be compatible to that of regular liver extract.

## ABNORMAL BLOOD PROTEIN

**QUESTION:** J. T., male, sixty-seven years of age, farmer. While visiting in Chicago in July, 1946, was seized with dysentery. Was in Presbyterian Hospital, Chicago, 12 days. The dysentery was controlled and x-rays made, which revealed no diagnostic lesion. He continued to lose weight.

In late December, 1946, his diarrhea returned, and has persisted. He has lost about 35 pounds. He has distention, at times intestinal obstruction, so alarming on occasion, a Miller-Abbott tube was introduced for relief. Colon filling as late as April 19, 1947.

**Impression:** No evidence of any organic lesion of the colon but the sigmoid is herniated into the hernial sack and this produces considerable mechanical obstruction both forward and retrograde which results in poor emptying of the bowel and retention of fluid and gas in the colon and some gas in the small bowel.

No ova or parasites found in stool. Blood normal; on April 11, 1947, his total blood protein was 2.8; albumen 0.9; globulin 1.9. Between that date and April 25, 1947, he had four 500 cc. transfusions, plasma on two occasions and daily amino acid by mouth. On this date his total protein was 3.2, albumen 0.45, globulin 2.7, a fall of 0.45 albumen.

This man had had hernial repair twice in ten years, which failed to hold. Could there be any relation between failure in the care of the hernia by surgery and this abnormal blood protein?

One observer in Chicago thought his condition was due to amebic dysentery and hyperthyroidism.

What suggestions can you give to raise the blood nitrogen constituent? What prognosis is offered in such a condition?

M.D.—Washington

**ANSWER:** Serum protein in these low concentrations is seen in the presence of chronic nephrosis, idiopathic steatorrhea or nontropical sprue, chronic ulcerative colitis and gastrojejunocolic fistula; more rarely, in profound malnutrition and starvation, in malignancy, in chronic pancreatitis, and in so-called idiopathic hypoproteinemia. Failure to include urinalysis among the laboratory procedures in the present instance implies that renal function was normal. The association of recurring episodes of diarrhea with hypoproteinemia directs suspicion to the bowel. Roentgenologic evidence of chronic ulcerative colitis, ileitis and gastrojejunocolic fistula being absent, further investigation for evidence of idiopathic steatorrhea is indicated.

Determination of the amount of fat in the stools, the concentrations of serum calcium, the size of erythrocytes, the prothrombin time (Quick), and the type of glucose tolerance curve obtained should give valuable information. Reversal of the albumin-globulin ratio raises the question of hepatic disease, but such low concentrations of serum protein rarely are seen in, and the history is not that of, hepatic disease. Obviously, more information is needed before an opinion as to etiology can be given.

A low content of protein in the serum may retard healing of wounds, but because the history, as given in the instance at hand, does not indicate the existence of hypoproteinemia as long as ten years ago, recurrence of the hernia at that time could hardly be attributed to hypoproteinemia.

A high oral intake of protein (150 to 200 gm. daily) should be employed, amino acids should be administered intravenously and blood transfused. Plasma may be administered, but there must be full realization of the dangers of serum hepatitis. The prognosis depends on the etiology, but unless a surgically removable lesion is found, the prognosis probably is poor.



# Staff and Serpent

## IS SCIENTIFIC MEDICINE TOO COMPLICATED?

ONE of the most glib of generalizations dispensed with pontifical infallibility by the brethren of the planned economy, argues that medicine has become too complicated for any one man to know it all. Sadly enough, even critically minded physicians repeat this nonsense, passing it on, as honest men do counterfeit paper, and thus giving it added currency by the credit of their persons.

This widely current generalization, when not spoken in ignorance, is mendacious. It is mendacious because it surreptitiously sneaks in a lying premise. The premise is that there *was* a time when some one man could know all of medicine: the sequential statement then follows—that now, because medicine has acquired so much knowledge it is beyond the competence of any one man to embrace it all.

The fact is that at no time in the history of mankind could any one man embrace all of the current medical knowledge, and the further back we go in history, the less of the total was it possible for him to encompass. Conversely, the closer we come to the present, the more of medicine can a man both know and understand. For modern science is in these respects vastly superior to the ancient science, that instead of giving us “systems,” it lays bare the basic principles by which there is governance of all there is in this universe, including man.

The phenomena that were individual and disjointed to the ancients are for us tied into one comprehensible whole by the matrix of some natural law or principle, in physiology, or chemistry, or pathology. Before we knew of the tubercle bacillus

there were a host of distinctive phthisical disorders; and before we knew of pathogenic microorganisms, bethink you, how many effluvia, miasma, distempers, dyscrasias, and psoras, were current as medical lore.

What order into a bedlam of confusion did Schleiden and Schwann bring, and Hooke, and Dujardin, and Morgagni, and Virchow, and Pasteur and Koch, and Claude Bernard and Cannon, and S. Ramón y Cajal, and Sherrington, and Freud! It is simpler far to be conversant with all that these men taught than to have known the theories and practices of the Hippocratic, Alexandrian, Pneumatic, Eclectic and other of the ancient schools. For the moderns speak a tongue that enlightens and feeds the intelligence, whereas the ancients, by the witness of Galen, were too often and too much a garrulous lot bent on being, and delighted in being, contrary. Not that the schools were without merit, and many partisans honest and earnest. No! That's beyond the point. But to know them all—that is, to know *all of medicine*, was a hopeless task, or, if not hopeless, certainly profitless for all but the historian.

But I flatter my brethren of the planned economy in expanding so broadly on what was, on their part, merely a vapid presumption. That isn't what they meant, at all! What they mean is that in order to treat a sick man, the doctor nowadays has to know so much more than he can, in order, you see, that the man should be treated “first-class.” Here, too, there is something sneaky. The implication always seems to be that the hypothetical sick man is seriously, yes, even desperately, ill. He never seems to be suffering from a simple

*katzenjammer*—or from a sunburn, an uncomplicated cut; from simple constipation, or the like. No, he always has something which calls for a "professor" and numerous, intricate, special knowledges and instruments.

But, of course, the picture is fake. We are dealing with the average doctor, and with his average patients, and I'll venture that on the scale of what is known and valid in medicine, the patient of today fares better at the hands and skills of his doctor, than did the patient of any other time, at the hands and skills of *his* doctor, as measured in the scales of what was then known and valid in medicine.

No, it is not a case of God's in His heaven, all's right with medicine! There are some things that aren't right. And one thing that wants righting is the deletion from the conversation of intelligent men of that ill-conceived and corrupting generalization about no man being capable of knowing all of medicine. No one ever claimed he could—and beside, it's only a sneaky effort to discredit the general practitioner, so that we might the sooner come to realize the *dream of dreams*: teams of state-hired, state-paid medicos, working on a belt chain system of medicine; each one an expert, knowing more and more of less and less . . . and caring even lesser.

The companion generalization to the one about no man knowing all of medicine, is, that the more scientific medicine grows, the more costly it becomes. This, too, is taken with an uncritical earnestness, and repeated without reservation, by many who should know better. And yet perhaps they are little to be blamed, for this generalization is bolstered with "fee tables and medical bills from the days of yore," and the contrast with the fees and costs of today appears not only marked but indubitable.

YET EVEN here the dice are frequently loaded, and the import of the figures is not what it is pretended to be. Thus as to fee tables: it much depends upon "*when and where*." Half a dollar pur-

chased so much meat at one time, and ten times as much at another. Unless, therefore, the purchasing power of the dollar, and the standard of living at the cited time, be taken into consideration, no valid comparisons are possible. But even if all the variable economic factors were properly evaluated and the calculations made precise down to a mil—what then? All that one could then say is that in 1840 a hypothetical visit by a hypothetical patient to a hypothetical doctor, cost X units of money, and in 1940 the cost was Y times X units.

That may delight the hearts of the brethren of the planned economy, for they love to have things figured out. But for the less naïve there always remains the matter of what you get for your money, and, assuredly, the hypothetical patient visiting a hypothetical doctor in 1940, received an incalculably superior "money's worth" than his counterpart could have gotten in 1840. By superior "money's worth" I mean not only better quality, but also *less costly*. Everyone recognizes the superior quality of modern medicine: few, however, recognize that it is in fact less costly, and that, not only in the relative, but also in the absolute sense. Illness for illness, if one takes into account not only moneys paid out but also losses in time, in productive competence, and in life span, it was more costly to be sick fifty years ago than it is today.

No, it is not true that the more scientific medicine grows the more costly it becomes. Quite the contrary! Contrast what it cost to treat a case of pneumococcus pneumonia (plus its almost inevitable complications) in 1880, with the costs of the same case in 1920, and again in 1947. Make the same calculation for the case of diabetes; of pernicious anemia; of osteomyelitis; of a Niserian infection; and you will see that it isn't true that the more scientific medicine grows the more costly it becomes. No! The more scientific it grows, the more of it is to be had, and those who would have all of its benefits must be ready to exchange some of their pottage for the birthright of better health.

G.

# Book of the Month— A Report

## DISEASES OF THE CHEST\*

A VALUABLE contribution to the basic understanding of the diagnosis and treatment of diseases of the chest is presented by Eli H. Rubin, M.D., and Morris Rubin, M.D., of New York City. The authors state that they are emphasizing roentgen diagnosis but they do not neglect disturbances in pathologic physiology which, in the last analysis, are also essential in diagnosis and treatment. Important contributions from the literature, as well as personal experiences, are included so that the book has definite merit for the chest specialist as well as the general practitioner and internist. Excellent illustrations and roentgen reproductions are used profusely and add much to the more complete understanding of the topics presented.

The contents of the book are divided into six major sections. The initial section deals with anatomic considerations and the technical aspects of chest roentgenography including fluoroscopy, usual roentgen technics, tomography, angiography, kymography, fluorography and mass roentgenography. The technic and importance of bronchospirometry in determining the respiratory function of each lung separately is outlined carefully. This test is important when bilateral collapse measures are used in the treatment of pulmonary tuberculosis. The advantages of roentgen diagnosis as compared to physical examination are stressed.

The second section deals with acute and chronic pneumonias. The means of avoiding toxic reactions to the sulfonamides are emphasized. The authors believe that penicillin should be preferred to the sulfonamides when renal disease, previous nephrectomy, urinary tract obstruction, liver disease, blood dyscrasias, or a history of toxic reactions to sulfonamides are present. Complications of

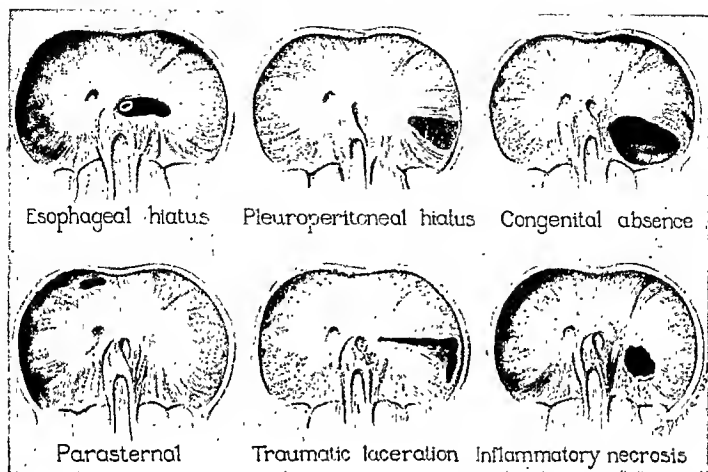
the sulfonamides which must be guarded against are referable to the gastrointestinal tract, the nervous system, and the kidneys. Other important reactions include the blood dyscrasias, skin eruptions, sensitization phenomena including drug fever, arthralgia and lymphadenopathy.

For the average case of pneumococcal or streptococcal pneumonia, the recommended dosage is 15,000 units of penicillin intramuscularly every three hours throughout the day and night. Sulfadiazine is recommended for the uncomplicated case of pneumococcal pneumonia, if seen early, because of the ease of its administration and its proved efficacy. However, penicillin is advised when the pneumonia fails to respond in forty-eight hours or if complications develop. Hemolytic streptococcal infections are preferably treated with penicillin from the outset because they are often associated with severe complications.

Suppurative pneumonias or lung abscesses are classified as embolic, bronchiogenic and those secondary to other pulmonary diseases or pathologic processes in adjacent organs. The important complications result from spread of the disease to the pleura or other organs, particularly the brain, spleen, liver or kidneys. Bronchiogenic aspiration in the same or contralateral lung and extension to the mediastinum occur occasionally. It is emphasized that lung abscesses should not be permitted to become chronic before surgical intervention is planned. The authors feel that surgery is indicated if there is any tendency for the abscess to enlarge or become chronic but that spontaneous healing may occur early in at least 50 per cent by means of chemotherapy and adequate postural drainage.

The treatment of putrid lung abscess is summarized as follows: (1) the determination of the type and exact location of the abscess; (2) chemotherapy, postural drainage and supportive measures as long as the abscess shows signs of healing spontaneously; and (3) surgical drainage if there

\*Diseases of the Chest: Emphasizing X-ray Diagnosis. By Eli H. Rubin, M.D. and Morris Rubin, M.D. 685 pages, 335 illustrations with 24 plates in color. W. B. Saunders Company, Philadelphia & London. 1947. \$12.00.



*From: Diseases of the Chest by Rubin*

Situations of congenital structural defects and traumatic lacerations of the diaphragm which cause the more common types of diaphragmatic hernia. (S. W. Harrington: *West. J. Surg.*, Vol. 44.)

is no tendency to healing or if there are other pressing indications.

The third section of the book is concerned with pulmonary tuberculosis. The view is expressed that the primary infection with the tubercle bacillus leads to early generalization and development of scattered hematogenous foci. The importance of routine mass roentgen surveys is stressed and it is pointed out that about 1 per cent of clinically significant tuberculosis will be found in unselected segments of the population. Of these, about one-third will have active pulmonary tuberculosis and two-thirds arrested or inactive disease. In those patients who have developed symptoms, the onset will be insidious, catarrhal, pleural, hemoptoic or pneumonic.

The important laboratory procedures recommended for the diagnosis of pulmonary tuberculosis are frequent examinations of sputum or gastric contents for tubercle bacilli, the erythrocyte sedimentation rate, and the tuberculin test. The accepted methods of examination for the recovery

of tubercle bacilli are given in some detail. The authors agree that the presence of the organism is the only infallible evidence of the existence of pulmonary tuberculosis.

The decreasing incidence of complications in pulmonary tuberculosis is pointed out in the next chapter. This is thought to be due to earlier diagnosis and improved methods of treatment. Illustrative figures are quoted from the New York Municipal Sanatorium, Otisville, New York, where in 1914, 25.6 per cent of the patients examined had laryngeal tuberculosis as a complication while in 1941, the incidence had decreased to 3.6 per cent. The handling of nontuberculous conditions such as amyloidosis, syphilis, heart disease, diabetes, and pregnancy when these coexist with tuberculosis is described.

The medical and surgical treatment of pulmonary tuberculosis is discussed in the following chapter. The nonspecific and specific therapeutic measures are described and pneumothorax is outlined in some detail. BCG is mentioned briefly

and its importance in this country is judged not great due to the continuing decline in the prevalence of tuberculosis. There is just a brief mention of streptomycin which is undoubtedly due to the completion of the book prior to the reports of its clinical use in tuberculosis. The surgical measures considered valuable include intrapleural and extrapleural pneumonolysis, diaphragmatic paralysis, pneumoperitoneum, thoracoplasty, cavity drainage, and lung resection.

The fourth major section deals with other important diseases of the lungs and bronchi. The authors discuss the pneumoconioses and other occupational hazards in some detail and stress the importance of differentiating between simple silicosis and silicosis with infection. Seven specific measures for prevention of silicosis are outlined.

Bronchial obstruction and its relation to diseases of the lungs, mediastinum, heart, esophagus, and spine is treated with the respect it deserves. It is emphasized that postoperative atelectasis may be prevented by specific preoperative, operative and postoperative precautions. The developmental factors in bronchiectasis are described as bronchial obstruction, infection, atelectasis, secretory pressure, and pulmonary fibrosis. The generally poor prognosis of bronchiectatic patients is stressed and Perry and King are cited as reporting that 41 per cent of 144 patients had died within five years of the onset of the bronchiectasis and only 15 per cent remained alive for twenty years or longer.

Medical measures recommended for therapy include prevention, postural drainage, bronchoscopy, and chemotherapy. The low mortality of surgical extirpation is stressed but, the authors point out, only a small percentage of patients with bronchiectasis meet the indications for lung resection.

The fundamental nature of bronchial asthma is discussed according to predisposing, secondary, and excitive factors. Pulmonary complications usually associated with bronchial asthma are considered chiefly the result of bronchial obstruction and infection. Loeffler's syndrome, an allergic pneumonia often developing in chronic asthmatics, is stressed to differentiate it from tuberculosis and atypical or viral bronchopneumonia.

The increasing incidence of bronchiogenic carcinoma is ascribed to an aging population, im-

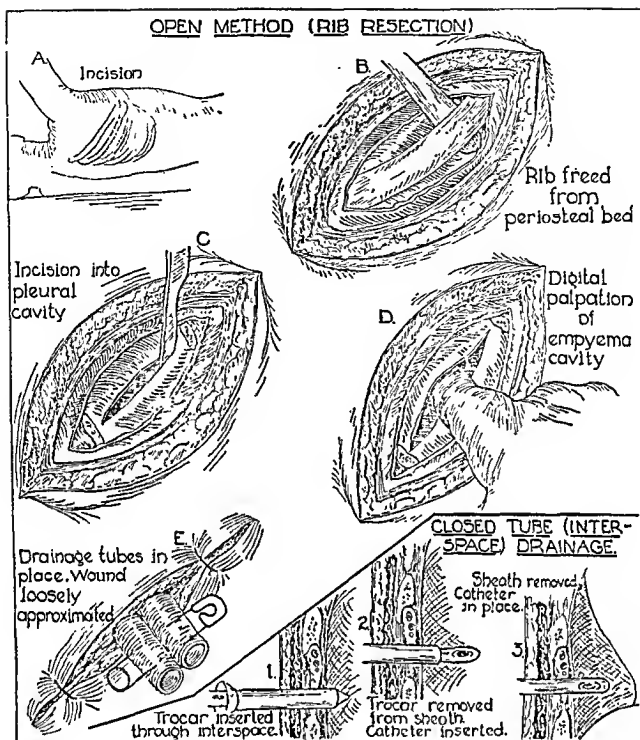
proved methods of diagnosis, and a greater accuracy in histologic differentiation. According to this text, there are no pathognomonic symptoms of bronchiogenic carcinoma and the diagnosis is dependent upon roentgenology and bronchoscopy. The physician is advised to follow the principle that any obscure lung disease occurring in an individual of cancer age is carcinoma unless proved otherwise. Pneumonectomy is described as the only treatment but diagnosis is usually made too late.

The fifth section of the book is devoted to diseases of the mediastinum, diaphragm, pleura, and related structures, including heart-lung disease. The mediastinal abnormalities are discussed under the headings of displacements, emphysema, infections, tumors, and lymph nodes. The differential diagnosis of mediastinal lymphadenopathy includes tuberculosis, coccidioidomycosis, lymphoblastoma and metastases. Mention is made of the marked increase in reported cases of diaphragmatic hernia due to improvement in diagnostic methods.

The chapter on pleural effusions includes a discussion of fibrinous pleurisy, pleurisy with effusion, and purulent effusions as well as the hydrothorax accompanying decompensated heart disease. The authors point out the difficulties encountered in making a definite diagnosis of the underlying disease in primary pleural effusion and emphasize that "idiopathic" pleurisy in a young adult is tuberculous unless proved otherwise.

Aspiration of pleural effusions is indicated for cytologic and bacteriologic study as well as for therapeutic purposes. The discussion states that 65 to 85 per cent of hemorrhagic pleural effusions are caused by malignant neoplasms of the lungs and pleura, although simple serous effusions may also be produced by carcinoma. They recommend search for tumor cells in examination of both hemorrhagic and serous effusions.

The concluding section of the book covers the principles of surgical treatment, emphasizing preoperative and postoperative care. The differences, from a surgical standpoint, between the individual with acute suppurative disease of recent origin and the chronically ill patient with chronic pulmonary suppurations, bronchiectasis, neoplasms, and tuberculosis are stressed from the standpoint of preoperative medical care and the frequency



From: *Diseases of the Chest* by Rubin

Open and closed methods of treatment of empyema thoracis. (Courtesy, Dr. C. Latimer Callander, Surgical Anatomy.)

of postoperative complications. Bronchoscopic examination to determine the operability of neoplasms, the exact localization of abscesses, and the presence or absence of endobronchial tuberculosis prior to the induction of pneumothorax is recommended whenever cases involving these conditions are encountered.

Brief discussions of surgical technic are included to enable the student to appreciate what the thoracic surgeon is doing. The final chapter deals with chest emergencies and includes treat-

ment of traumatic hemothorax, traumatic and tension pneumothorax, crushing chest wounds, and thoraco-abdominal injuries.

An excellent bibliography is included for each subject discussed and the contents are well indexed. There are few typographical errors. There is one error of some importance on page 81 where the dosage of sulfadiazine is given as approximately 0.5 gm. per pound where 0.05 gm. per pound is probably meant. This book can be recommended to all physicians interested in diseases of the chest.

S. C.

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# Birth of a Drug

**T**HERE was a time when compounding a remedy was like making a witch's brew. A little of everything available was used on the theory that at least one of the conglomerate elements would benefit the patient. Now modern scientific and industrial technics have been wedded, and the old theory is reversed. Every effort is made to eliminate all but the essential ingredients.

Today research is planned. A new therapeutic agent is the result of the coordinated efforts of a team of scientists. Rarely is a new drug discovered by one man or by recognition of a fortunate accident. The spectacular exception, penicillin, merely proves the rule. More typical is streptomycin.

The objective of Dr. Selman A. Waksman and



*Photo from Wyeth, Inc.*

## PHARMACOLOGIST TESTS THEORIES

his associates was an antibiotic that would destroy gram negative bacteria in the body without exerting toxic or other undesirable effects. The bacteriologist devised special methods for isolating antagonistic organisms from enriched soils, composts, manures, and peat bogs. Thousands of actinomycetes and fungi were isolated and the antibiotics they excreted were studied.

The pharmacologist has been, and still is, concerned with elucidating the nature of erratic untoward reactions associated with streptomycin. With him works the organic chemist. Together they devise innumerable screening tests to obtain the maximum amount of information. Vivid imagination, keen insight and untiring application are needed to bring a new drug to the bedside of a patient.



*U. S. D. A. Photograph*

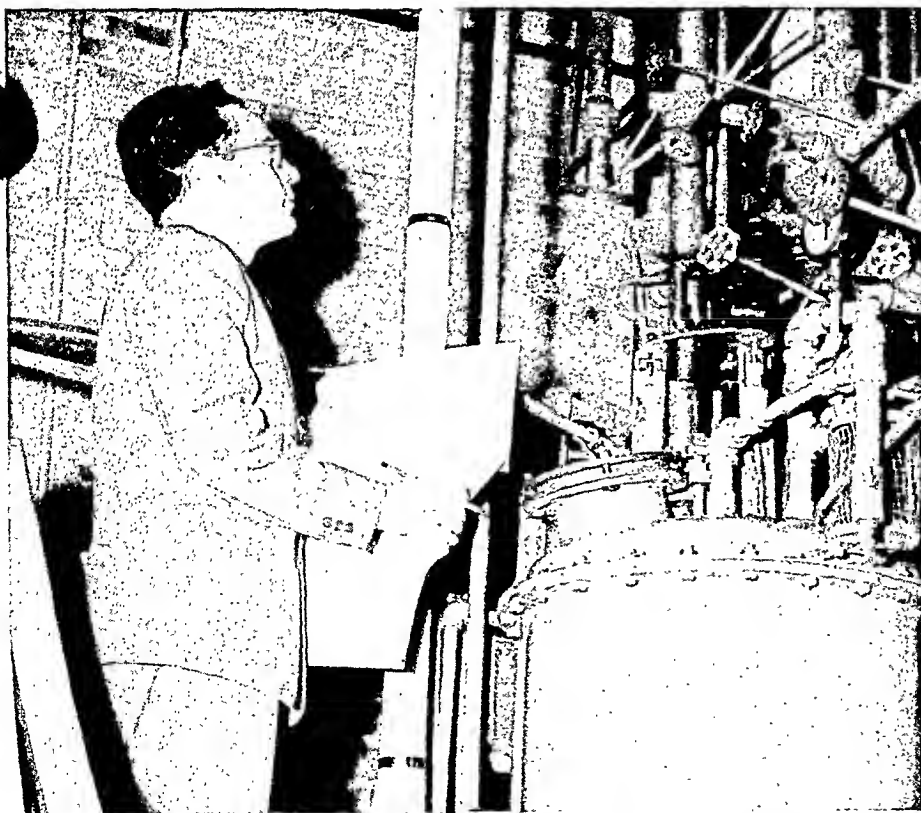
## BACTERIOLOGIC TECHNIQUES ARE BASIC





CLINICAL TRIALS FOR  
EFFICACY, SAFETY AND  
OPTIMUM DOSAGE

*Photo from U. S. Public Health Service*



CHEMICAL ENGINEER  
DEVELOPS MANUFACTURING  
PROCESSES

*Photo from Merck and Co., Inc.*

A major role is played by the biochemist in the development of new drugs, and in isolating and identifying substances having therapeutic merit.

Evaluation of a new therapeutic agent depends upon the results of careful clinical trials. The clinician is the indispensable cog in the modern machinery necessary for the development of a new drug. His is the final decision as to the usefulness and safety of the new product.

Nowadays the clinical investigator is seldom a solitary worker, but is a leader of a team of specialists. By association with colleagues in other institutions he is able to broaden and hasten his attack on a problem.

Often the solution of a problem by a clinician raises new problems which are referred back to the organic chemist, the pharmacologist, the biochemist or other laboratory scientists, thus initiating a new chain of investigation.

Thus, as a result of the combined efforts of many trained men, the physician is able to prescribe for his patient, confident that the ingredients are tried and tested and that the medicament will act in an expected and predictable manner.



Photo from Block Star

#### TESTS INSURE UNIFORM PRODUCT



Photo from Journal of American Pharmaceutical Association

# What Other Editors Think

## Editorial Evaluations of Current Contributions To Medical Progress

### NICOTINE AND FERTILITY

THERE are now in the literature several papers which show that nicotine when administered daily to animals over a period has some effect on fertility, as indicated by the occurrence of abortion, of premature births, of stillbirths, and of a decrease in the number of young born.

There are also a good many reports on human subjects, though these are mostly less convincing than that of Phillips, who established a relation between smoking and immotility of spermatozoa in a young man. When he stopped smoking motile sperms appeared; when he resumed smoking motility disappeared; when he stopped again motile sperms appeared again.

Thienes, Lombard, and their colleagues have recently described some experiments in which they have measured the fertility of rats injected daily with nicotine in comparison with that of control rats injected daily with saline.

There were three experiments in which, taking the three together, 92 pairs of control rats were compared with 83 pairs injected with nicotine. Of the control pairs only 17 per cent were not fertile over a period of nearly twelve months, while of the pairs injected with nicotine as many as 33 per cent were not fertile. Not only was the percentage of non-fertile rats about twice as great in those injected with nicotine as among the controls, but the number of progeny was much less. Each control pair had on the average 28 young in the experimental period, while each pair receiving nicotine had only 19 young. The doses of nicotine were 2.0 to 2.5 mg. per kg. given twice a day, and were nearly as large as could be given without causing convulsions.

Lombard has pointed out that the relative daily dose injected into rats in these experiments would correspond to the maximum amount of nicotine

which could be absorbed from 40 cigarettes. Lombard's estimate of the amount of nicotine absorbed seems excessive; it would be difficult for the most determined inhaler to take in 7 mg. from one cigarette, and there is good reason to believe that a cigarette normally yields about one-tenth of this. But Lombard assumes that the rat and man are equally sensitive, and again there is good reason to believe that man is much more sensitive to nicotine than the rat. In the effect of nicotine on the hypothalamus, man is from 100 to 200 times more sensitive than the rat.

Here then is an important addition to the evidence that smoking is far from being a harmless habit.

*British Medical Journal*, 4496, p. 303.

### STREPTOMYCIN RESISTANCE

THE older anti-infective drugs, quinine and Tarsphenamine, stimulate the body defenses rather than being in themselves directly plasmodicidal or spirocheticidal. Characteristic of modern chemotherapy as contrasted with that of a generation ago, is that the *in vivo* and *in vitro* antiseptic actions tend to parallel one another closely.

Penicillin is believed to act only upon rapidly growing organisms, and to destroy them at the time of fission. Streptomycin's activity has its effect upon intermediary metabolism, upon a phase of cell nutrition, rather than upon the bacterial cell just at its time of division. Streptomycin differs from penicillin also in that it has some direct bactericidal action upon resting, non-growing, bacterial cells.

Resistance to streptomycin develops rather quickly in rapidly growing cultures. A very susceptible organism may be cultured in a medium which contains some streptomycin for perhaps a dozen subcultures, following which it is no longer susceptible

to fairly high concentrations of the drug. This particular organism is then resistant in the growing and in the resting stage. Resistance, however, develops only in growing organisms, not in those which are left suspended in contact with streptomycin. Growth and presumably internal metabolic change are necessary for development of the characteristic of resistance. The acquired immunity, however, then becomes inherent in the strain at least for a considerable period.

Resistance to the antibiotics thus may be easily developed *in vitro* and presumably by the same mechanism in the human host. However, another mechanism of *in vivo* resistance has been suggested, which depends upon the escape of susceptible bacteria into the reticulo-endothelial cells of the body where streptomycin and penicillin do not penetrate. It is not difficult to maintain a high concentration of penicillin or streptomycin in the blood stream; however such tissues as the liver and spleen ordinarily remain negative for the antibiotics. Nelson and associates of Frederick, Maryland, suggest that this escape into the body tissues may explain many of the failures to cure completely with streptomycin. Certain pathogenic bacteria are facultatively intra- or extra-cellular, that is, they are capable of development either outside of or within the host cells. Nelson and associates investigated the possibility of combining streptomycin with a colloidal compound which might enable the antibiotic to penetrate into the liver and spleen cells.

They chose trypan blue, a dye prepared with the desired electric charge and proper degree of acidity. Experimental mice and guinea pigs treated with the streptomycin-dye combination showed the antibiotic in the blood and also in the organs which are rich in endothelial tissue, the liver and spleen. Streptomycin appeared within an hour after the trypan blue-streptomycin suspension was injected and the level remained high for twenty-five hours. Streptomycin not only entered the liver and spleen and remained there for twenty-five hours, but these organs at all intervals contained a higher level than did the blood stream. The streptomycin-dye suspension appeared to be concentrated in these organs.

*Southern Medical Journal, Vol. 40, p. 449.*

## RADIOPHOSPHORUS

Physicists like Sir James Shadwick state that artificially produced radioactive elements prepared in atomic piles will soon be readily obtainable for the treatment of disease. Two questions at once arise: for what conditions is such radioactive treatment useful, and how is the "dose" to be controlled?

Studies of the fate of  $P^{32}$  in the body showed that it is rapidly taken up by both red and white blood cells within the first twenty-four hours; the red cells lose their  $P^{32}$  after forty-eight hours, but leucocytes retain their quota for a very long time, mainly in the nuclei. The tissues that take up most  $P^{32}$  are bone-marrow, lymph-nodes, liver, and spleen; leukemic tissues take up much more than normal tissues. Many, but not all, forms of neoplastic tissue selectively absorb radiophosphorus. The degree of cellularity influences the uptake—for instance, in Hodgkin's disease the uptake of  $P^{32}$  decreases with increasing fibrosis of the lymph-nodes—because  $P^{32}$ , like normal  $P^{31}$ , is built into nucleoprotein; so the tissues multiplying fastest take up most  $P^{32}$ . Since the presence of much  $P^{31}$  reduces the uptake of  $P^{32}$ , in therapy the proportion of  $P^{31}$  should be kept as low as practicable. Unfortunately with  $P^{32}$ , as with other lethal substances, the difference between the concentrations in neoplastic and normal tissue is not wide enough to allow the former to be destroyed without affecting the latter; if enough  $P^{32}$  were given to destroy all the leukemic cells, the tissues producing red cells and platelets would also be fatally affected.

The radiophosphorus was used in the form of diatomic sodium phosphate in an isotonic solution (15 mg.  $Na_2HPO_4$  per c.cm.). The initial activity of such a solution was 0.20-0.40 millicuries per c.cm.; it gradually lost activity, but could be used until 0.04-0.05 millicuries per c.cm. was reached. Small frequent intravenous injections were given in preference to doses by mouth; the initial dose was 0.1-2.5 millicuries, and treatment was at first given two or three times a week. When the oral route was used the doses were larger, since only about 75 per cent of the dose is absorbed. For comparison with x-ray treatment it has been calculated that if 1 millicurie of  $P^{32}$  is

retained for twenty-four hours by a 70 kg. adult, the effect will be equivalent to 0.6 roentgens of whole-body radiation.

The dose was carefully controlled by watching changes in the peripheral blood; in leukemias with high white-cell counts, and in polycythemia, the aim was to restore the blood count to normal. In other diseases control was not so easy; in malignancy and Hodgkin's disease the treatment was continued until blood changes showed that bone-marrow activity was depressed; leukemic patients without a raised white-cell count received doses similar to those found effective in the commoner type; in a few patients serial bone-marrow punctures were used. The dose required to bring about a given effect varies greatly from patient to patient, even in clinically similar stages of disease. The dose must therefore be carefully controlled and adjusted to the response in every case.

The best results have been in polycythemia vera. In chronic myeloid leukemia treatment greatly relieved the symptoms, reduced the size of the spleen and produced a remission in the anemia. P<sup>32</sup> did not affect acute relapses or typical acute forms; nor, oddly enough, did it reduce enlarged lymph glands which had resisted x-ray treatment. In lymphatic leukemia P<sup>32</sup> gave less satisfactory results; a similar treatment scheme somewhat improved signs and symptoms, but not so much as in myeloid leukemia. Monocytic leukemia did not respond at all, and patients with multiple myelomas obtained only insignificant relief. In Hodgkin's disease and lymphosarcoma the results were poor compared with those of radiation. A few patients with other forms of malignancy, such as carcinoma of the breast and gallbladder, and malignant melanoma, were given P<sup>32</sup> without any effect.

*The Lancet, Vol. 252, p. 525.*

## STREPTOMYCIN

STREPTOMYCIN has been generally available to the medical profession of this country for several months, and by now, most physicians have had the opportunity of observing the use of strepto-

mycin in occasional patients of their own or of their colleagues. A considerable literature dealing with this antibiotic has also accumulated and many additional reports of its use will undoubtedly continue to appear in the near future. A fairly thorough review of the available literature on this topic is presented in this issue and in the preceding issue of the Journal.

Streptomycin, as pointed out in this review, has not lived up to all that was expected of it when it first made its appearance. It has, however, provided an effective cure for certain infections for which other available antibacterial agents have not proved successful and offers an alternative or additional agent in some infections that are only partially affected by sulfonamides, penicillin, or specific immune serums. It is the first agent to receive careful and extensive study in the treatment of tuberculosis, with some promise of at least limited success.

The exact place that streptomycin will occupy in the treatment of infections, particularly tuberculosis, cannot be predicted at this time. Its greatest disadvantage has proved to be the great ease with which resistant strains become established during the course of treatment. This alone may eventually limit, if not entirely vitiate, its usefulness in tuberculosis and in other infections, particularly those whose courses tend to be subacute or chronic. Its toxicity, although not of a high order, is significant. This is particularly true of the otic complications, which seem to be caused by the antibiotic itself and not by any impurity and which may leave serious and possibly permanent damage. Moreover, the treatment is expensive by any standard, and is likely to remain so.

These facts justify a sustained and intensive effort to discover new, more potent, and more widely effective chemotherapeutic and antibiotic agents. The discovery of the chemical structures of penicillin and streptomycin and the recent advances in the knowledge of bacterial metabolism in relation to chemotherapy offer considerable hope for synthesis of such agents in the not too distant future. In the meantime, the best use should be made of the agents that are now available.

*The New England Journal of Medicine, Vol. 236, p. 766, Robert N. Nye, M.D., Managing Editor.*

# Recent Advances in the Control of Rheumatic Fever

CHARLES S. HIGLEY\*

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NEITHER rheumatic fever nor rheumatic heart disease have been reportable diseases in civil life; hence their actual incidence can only be surmised. However, Swift estimates that there are probably between 30,000 and 60,000 deaths from rheumatic heart disease in the United States a year and between 200,000 and 260,000 new cases of rheumatic fever a year. In the military services acute rheumatic fever presented one of the great problems of nontraumatic military medicine. Its incidence in World War II markedly exceeded that observed in similar age groups in civil life, although the disease was of a milder nature. During the months of April and May 1944, which represented the period of highest incidence, an average of 100 new cases were reported weekly from Army Air Force military posts alone and about 8 per cent of these developed evidence of cardiac damage.

In view of these circumstances the Army Air Forces established a rheumatic fever control program and much of the data presented here were gathered under its auspices. The program

allowed a concerted opportunity to study and treat this disease on a large scale.

## ETIOLOGY

A very high incidence of our cases of rheumatic fever could be shown to have their attack preceded by Group A beta-hemolytic streptococcal infection of the upper respiratory tract. Although this relationship has been recognized for a number of years, the war gave the opportunity to prove it on a large scale.

The present-day classification of streptococci dates back to Brown's work in 1919 in which he defined three varieties from their characteristics on blood agar—alpha, beta, and gamma. Alpha is commonly called *Streptococcus viridans* and is most commonly known as the cause of subacute bacterial endocarditis. Gamma is probably not of pathogenic significance, but beta or hemolytic streptococci are common pathogens for man. Beta-hemolytic streptococci may be further subdivided by precipitin tests into groups, of which Group A is the most common pathogen. The Group A streptococcus may be further subdivided into forty-seven types by a precipitation reaction. Identification of these types was first reported by Griffiths in England in 1926 and during the last few years

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NOTE—Read before the meeting of the Interstate Postgraduate Medical Association of North America, Cleveland, Ohio, October 15 to 18, 1946.

has been completed by Drs. Lancefield and Swift at the Rockefeller Institute. Epidemics of Group A beta-hemolytic streptococci usually show a predominance of one type. Types 17 and 19 were the commonest found in this country during the war.

The usual course of events in rheumatic fever is as follows: first, an upper respiratory Group A hemolytic streptococcal infection, designated by some as Phase I; second, a quiescent stage, designated as Phase II, which may be considered as an incubation period and the stage of rheumatic activity; then Phase III, which takes numerous forms and varies in duration from a few weeks to several years.

The original upper respiratory infection may be so mild as to escape detection unless careful cultures are made from both the throat and nasopharynx, or so severe that abscesses form in the peritonsillar tissues. The distinguishing characteristic of a respiratory infection, so far as inducing rheumatic fever is concerned, is that it is induced or accompanied by Group A hemolytic streptococci. Because such respiratory infections as colds, influenza, catarrhal fever and comparable diseases are not precursors of rheumatic fever unless complicated by Group A hemolytic streptococcal infections, statistical studies of the relationship between respiratory infections in general and the onset of rheumatic fever in particular have little significance unless qualified by careful modern bacteriologic data.

It is now fairly definitely established that infections of human beings with streptococci belonging to groups other than Group A do not set off attacks of rheumatic fever. It is true that a rise in streptococcal respiratory infections is usually accompanied by an increase in the incidence of colds, but the converse does not always hold. The autumnal epidemics of colds are usually devoid of streptococcal complications, whereas such complications were found to be relatively much more common in late winter and early spring—the season of the highest incidence of rheumatic fever. We found that the clinical diseases that most commonly induce rheumatic fever are streptococcal na-



CHARLES S. HIGLEY

sopharyngitis, follicular tonsillitis, and scarlet fever.

#### CONTROL MEASURES

WITH this background of knowledge, it is obvious that control of streptococcal disease offers hope of being a major factor in the prevention of rheumatic fever. The use of sulfadiazine in large-scale prophylaxis was first used in 1943 as a means of control of meningococcus meningitis. The following year it was used at a number of installations showing high respiratory rates, with rather striking results. The experience of Warren at Truax Field is probably typical of the experience at other fields. He administered 1 gm. of sulfadiazine daily to a group of 6,000 men for twenty-one days. Ten days after the first group was started, a control group of 3,000 men was started on the same dose. All hospital and sick call admissions for acute infectious diseases in both groups were charted.

Results showed a marked reduction in nasopharyngitis due to beta-hemolytic strep and in scarlet fever. As could be expected, no effect was noted on primary atypical pneumonia, mumps, or measles. The rheumatic fever rate showed no change until about twenty days after therapy was started. This delayed effect fits in with our present conception of the etiology of rheumatic fever. The incidence of drug reaction among these 9,000 men was only .37 per cent. This agrees with the figures published by Holbrook on the experience of the A.A.F. on 40,000 troops given prophylaxis. He stated that .12 per cent had some type of reaction but that only .03 per cent had a reaction severe enough to lose time from duty.

This method then has value in its place, when disease rates in groups such as schools or institutions reach epidemic levels and especially if the disease is streptococcal in nature. It is only of value in groups and should not be interpreted as applicable to individuals in private practice, for instance. Other means of control of airborne streptococci tried in the A.A.F. program were the laying of dust by oiling blankets and floors and air sterilization by means of vaporizing sodium hypochlorite or propylene glycol. None of these measures gave as encouraging results as was hoped for and their use was not continued on a large scale.

#### DIAGNOSIS

Although the diagnosis of acute rheumatic fever may be relatively simple, in many cases it is quite difficult. The necessity of accurate diagnosis is obvious, for a false positive diagnosis may unnecessarily subject a patient to prolonged hospitalization with a possible development of a neurosis involving the heart or musculoskeletal system. On the other hand, to overlook a positive diagnosis of rheumatic fever may result in improper treatment and the development of rheumatic heart disease.

Dr. T. Duckett Jones has presented his criteria for diagnosis in a concise form which establishes the best standard for today. He presents five major manifestations for diagnosis:

(1) carditis, (2) arthralgia, (3) chorea, (4) subcutaneous nodules, and (5) history of recurrent attacks. Of these major manifestations at least one should be present. Minor, or less specific, manifestations are fever, abdominal pain, precordial pain, rash, epistaxis, pulmonary changes, and laboratory findings including chiefly electrocardiographic changes and an elevated sedimentation rate. The latter is probably the most important. Jones believes that it is necessary to have, in addition to one major manifestation, at least two minor manifestations to make the diagnosis certain.

Two special laboratory tests are of value in determining whether a patient has recently sustained a Group A streptococcal infection. These may be of value in helping to establish a diagnosis of rheumatic fever in patients with only minimal clinical signs. The antifibrinolytic blood level determination is a relatively simple procedure and can be performed in the average hospital laboratory. It is reasonable to conclude that this test is positive in 85 per cent of Group A infections in five to seven days after onset. The antistreptolysin blood serum titer determination is a complex procedure requiring special apparatus and specially trained technicians. One hundred units or more is looked on as positive. In acute rheumatic fever this test is almost always positive.

#### EXPERIENCE IN THE A.A.F.

In analyzing cases diagnosed as having rheumatic fever in the A.A.F., Connors followed 1,072 cases of rheumatic fever in white enlisted men from all sections of this country. The following are a few highlights in his survey: (1) The familial incidence of rheumatic fever and heart disease was not high. (2) In the personal history of the individuals 60 per cent had their initial attack of rheumatic fever in the Army. Approximately one-half had had their tonsils removed prior to their attack in the Army. Almost 23 per cent had had scarlet fever in the past. (3) Cases occurred in individuals from every part of this country and the incidence was largely in accord with



state populations. (4) The average case began in March in a soldier nineteen years of age, in the service six to twelve months. He had been at a northern post one to three months before acquiring his inducing infection. Rheumatic fever began within twenty days of this infection. (5) The vast majority had joint involvement in a lower extremity, with more than one joint involved. The next most common involvement, excluding the heart, was the skin, especially erythema marginatum. (6) There was transient evidence of cardiac involvement as indicated by the development of a murmur in about two-thirds of the cases. Very few showed any change in cardiac rhythm. About one-half had transient EKG changes. (7) In a smaller group observed throughout a convalescent period of six months cardiac abnormalities disappeared in all but 8 per cent, emphasizing that permanent cardiac sequelae are not common. (8) Three cases died. Slightly more than 16 per cent were given a medical discharge. Sixty per cent were returned to duty and the others were still convalescing in rheumatic fever convalescent centers. Thus it can be seen that we were dealing with a relatively mild form of rheumatic fever in the Army.

#### TREATMENT OF ACUTE ATTACK

**B**ETWEEN November 1942 and August 1945, my associates and I treated 186 well-authenticated cases of acute rheumatic fever at the A.A.F. Regional Hospital, Madison, Wisconsin, and this afforded the opportunity to use various forms of treatment and draw some conclusions as to their relative effectiveness.

It is well to stress the difficulty of accurately evaluating therapeutic measures in this disease. The major value of any therapeutic measure in rheumatic fever is the prevention of cardiac damage. Because it may take several years for clinical evidence of damage to become evident, a close follow-up of cases should be conducted for several years to throw light on this question. This, of course, we were unable to accomplish. Furthermore, the accuracy of a comparison of other features such as the effect on sedimenta-

tion rates and duration of fever depends on the similarity of cases being observed. We know rheumatic fever cases vary greatly in their individual severity as well as in yearly and seasonal variations. Also, some cases run a monocyclic and some a polycyclic course. In spite of these difficulties, it is believed that we are in a position to make some generalizations, on the basis of our experience, owing to the large number of cases observed.

#### GENERAL TREATMENT

Little need be said here about the well-established methods of general treatment, such as an adequate nutritious diet with ample vitamins and protein, protection from exposure to streptococcus infections, and rest until clinical and laboratory evidence of rheumatic activity is gone. These measures are well proved and were utilized in our entire series.

Sulfonamides have been ruled out as of value in the treatment of the acute attack by the work of Swift and Jones, who demonstrated that sulfonamides in the acute stage of the disease have no beneficial effect and in fact may increase the severity of the disease. However, the prophylactic use of sulfonamides, during remissions to protect against streptococcal reinfections is thought to be of value. Thomas has recommended the use of a half gram of sulfadiazine twice daily, year round for five years following the first attack.

Penicillin was used in a cooperative study at Buckley Field, Kearns Army Air Base, and Truax Field Regional hospitals. Thirty-eight cases were treated in doses of 25,000 units at three-hour intervals for a total of 1,000,000 units. No benefit could be demonstrated in any case, and definite aggravation of the course of the disease was evident in several cases.

X-ray has been used therapeutically in the treatment of carditis by Levy and Golden, but no great enthusiasm has been shown by others who have used it. Streptococcus vaccines have been used by Swift who reported unsuccessful results. Antistreptococcus serum also has been tried and again the results were not beneficial.

## SALICYLATE THERAPY

For more than half a century it has been recognized that salicylates are the most useful drugs in the treatment of rheumatic fever and their action seems to be specific in the alleviation of symptoms. In 1933 Findlay made the claim that salicylates also had a protective action against carditis in rheumatic fever. Coburn published an article in December 1943 in which he also claimed a specific action by salicylates in the prevention of carditis and gave his hypothesis as to the nature of this action. In a series of 38 cases treated by doses of 10 to 20 gm. intravenously, he reported that no cases had developed heart disease in one year, whereas in 63 cases treated with smaller oral doses, 21 had developed evidence of heart disease in a year.

He reported that patients with plasma salicylate levels of 35.9 to 40.0 mg. per cent showed a prompt and progressive subsidence of rheumatic inflammation, whereas cases with plasma levels below 25 mg. per cent continued to manifest an active inflammatory process. He stated that the intravenous administration of sodium salicylate is required to maintain a rapid rise in plasma concentration of 40 mg. per cent or higher. He then concluded that a plasma salicylate level of at least 35 mg. per cent may be required to suppress rheumatic activity and that plasma levels below 20 mg. per cent may relieve symptoms although masking a progressive inflammatory process.

*Methods*—We have used salicylates in three different methods in an effort to compare the effectiveness of each method and in an attempt to repeat Coburn's successful results. Minimal oral salicylate dosage was used in 88 cases. In this method 2 to 7 gm. of sodium salicylate with equal doses of sodium bicarbonate were given every day until symptoms were relieved and then a small maintenance dose was given. The total weekly dose remained under 60 gm.

Maximal oral salicylate dosage was used in 50 cases. Ten or more grams of sodium salicylate were given every twenty-four hours until the sedimentation rate was normal for two

weeks. Sodium bicarbonate in doses of 0.6 gm. was given with the salicylate doses.

Intravenous salicylate dosage as specified by Coburn was used in 48 cases. Ten to 14 gm. of sodium salicylate were given daily in 1 liter of normal saline for seven days and then the patient was given the maximal oral treatment. The solution was prepared at the hospital by dissolving 10 gm. of chemically pure sodium salicylate in 20 cc. of distilled water, bottling in rubber-stopped vials, and autoclaving. This solution was then added to 1 liter of saline at time of use. Sodium bicarbonate was not given routinely with this method.

*Salicylate levels*—Plasma salicylate levels were determined at frequent intervals by the method of Coburn and his associates. It was found that with the minimal method, levels reached 16 to 30 mg. per cent. The maximal oral method gave levels of 20 to 60 mg. per cent and the intravenous method gave levels of 22 to 60 mg. per cent. Levels of 30 mg. per cent or above were found usually in the second day of therapy by the maximal oral method, the third day by the intravenous method, and were seldom reached in the minimal oral method. High levels were more readily maintained by oral dosage than by intravenous in the usual case.

IT HAS been shown by Smull and her associates and by Ma'or P. K. Smith that with the simultaneous administration of equal amounts of sodium bicarbonate and oral salicylates the resulting level was lower than without bicarbonate. This has been true in our experience, and the mechanism is probably due to increased excretion of salicylate in the urine. Although sodium bicarbonate does aid in minimizing nausea with oral dosage, the disadvantage of lowering of salicylate levels makes it wise to give only minimal doses.

*Results*—Although it is recognized that evaluation of symptomatic relief afforded by a medication is difficult, we believe that we observed some advantage in intravenous salicylate in this respect. In many cases relief for painful

state populations. (4) The average case began in March in a soldier nineteen years of age, in the service six to twelve months. He had been at a northern post one to three months before acquiring his inducing infection. Rheumatic fever began within twenty days of this infection. (5) The vast majority had joint involvement in a lower extremity, with more than one joint involved. The next most common involvement, excluding the heart, was the skin, especially erythema marginatum. (6) There was transient evidence of cardiac involvement as indicated by the development of a murmur in about two-thirds of the cases. Very few showed any change in cardiac rhythm. About one-half had transient EKG changes. (7) In a smaller group observed throughout a convalescent period of six months cardiac abnormalities disappeared in all but 8 per cent, emphasizing that permanent cardiac sequelae are not common. (8) Three cases died. Slightly more than 16 per cent were given a medical discharge. Sixty per cent were returned to duty and the others were still convalescing in rheumatic fever convalescent centers. Thus it can be seen that we were dealing with a relatively mild form of rheumatic fever in the Army.

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# The Use and Abuse of Forceps

JOHN W. HARRIS\*

UNIVERSITY OF WISCONSIN SCHOOL OF MEDICINE, MADISON

THE introduction of the forceps in obstetric practice by the Chamberlen family in the last part of the sixteenth century was truly a revolutionary event. Up to that time, there was no known instrumental method for the delivery of a living child, although instruments of destruction and manual operative methods, chiefly version and extraction, had been in use for centuries.

As the use of the forceps became better understood and the instrument was improved, it proved a veritable boon to obstetric practice. Especially did it largely abolish one of the most distressing complications of labor, namely, vesicovaginal fistula, the result of prolonged pressure of the fetal head against the bladder. Although such fistulas are still all too common, today they usually are the result of either gynecologic surgery or radium burns and rarely is one encountered as the result of birth trauma. As is the case with many other advances in medical practice, the widespread use of the obstetric forceps has led to certain abuses that should not be ignored.

In any discussion of the use of forceps one of the points that should be stressed most is the

need for a thorough understanding of the conditions that must be fulfilled before the operation can be given serious consideration. First and foremost, the cervix must be fully dilated. The forceps was never intended to be used as a cervical dilator and when so used can only result in disaster to both mother and child. Obviously, the membranes must be ruptured. There must be no marked disproportion between the maternal pelvis and the fetal head. Again, the obstetric forceps was never intended as an instrument of compression, and, when it is so used, severe intracranial damage all too frequently results.

With one exception, the child must present by the head and an accurate knowledge of the position of the head is vitally necessary. In general, the shape of the instrument is such that it can only be applied with safety to the sides of the head, regardless of its position in relation to the pelvis.

One can certainly take no credit to himself when he delivers a baby with forceps marks over the frontal and occipital regions or even with a black eye. Application of the forceps elsewhere than to the sides of the head all too often results in tentorial tears with accompanying intracranial hemorrhage, occasionally with compression fracture of the skull, and usually

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with severe laceration of the maternal soft parts. The one exception to this last-named requirement is the application of forceps to the after-coming head in breech presentation. While the majority of breech deliveries can be completed safely by the Mauriceau maneuver or one of its modifications, most authorities now agree that if any serious difficulty is encountered in the delivery of the head, it is wise to assist the delivery by the application of forceps.

The last requirement for the use of forceps is that the head must be well engaged in the pelvis. It is axiomatic that the higher the head is arrested in the pelvis, the more difficult and dangerous the operation becomes. The reason for this is two-fold: the higher the head, the more difficult it is to apply the forceps with accuracy; and, secondly, the greater the distance that the head must be delivered by traction, the greater the likelihood of severe trauma to both fetus and mother. Fortunately, the high forceps operation has been relegated to the obstetric ash-heap. As a rule, when the head becomes arrested above the level of the ischial spines it means that some complication, such as a contracted pelvis, a head that is too large to pass with safety through the pelvis, or malposition of the head, has been overlooked and should have been corrected long before the second stage is reached. In those rare obstetric accidents such as prolapse of the cord with the head high, delivery can usually be terminated more safely by version and extraction than by forceps.

It is the usual custom to list many of the indications for the use of forceps under two general headings, fetal and maternal. As a matter of fact, one category may suffice. To paraphrase De Lee, we do forceps operations because a normal birth cannot occur quickly enough to insure safety to either child or mother or both. Undoubtedly, if given sufficient time, the majority of such babies would be born spontaneously but with unwarranted hazards to one or both patients.

The fetal indication of paramount importance is so-called fetal asphyxia—in most in-

stances more correctly termed fetal anoxia. This may be produced by prolonged pressure of the head on the pelvic floor, by interference with the circulation through the cord thereby preventing adequate oxygenation of the fetal blood in the placenta, and, most often, by the excessive use of analgesic and anesthetic drugs in labor. Recent work by Lund in our own department has convinced us that the most reliable criterion of fetal embarrassment in labor is the fetal heart. Lund showed that the so-called rapid fetal heart rate rarely occurs and, when it does, is of little significance. However, when the rate falls to one hundred or less between contractions, it usually means that the fetus is suffering from oxygen want. Harris and Waters showed that in such cases the administration of pure oxygen to the mother between uterine contractions will restore the fetal heart to its normal rate unless compression of the cord is present. This procedure, which is quite simple and which can be carried out with a minimum of apparatus, in our hands has proven most valuable. It has permitted us to carry many patients to spontaneous completion of delivery—patients who, without this aid, would probably have needed forceps delivery.

THE maternal indications for the use of forceps again may be included under the time factor; namely, that delivery cannot be completed quickly enough to prevent unwarranted stress and strain to the mother. As will be discussed later a strict interpretation of this statement can, without doubt, lead to serious abuse of the obstetric forceps. However, there are many instances such as prolonged arrest of the head in the second stage, when the mother as well as the child may be subjected to very real danger through permitting labor to continue. In addition, certain conditions are encountered such as myocardial damage, severe diabetes, a uterus weakened by a previous cesarean section scar, and the like, where it is often advisable to terminate labor by forceps as soon as the head reaches the pelvic floor.

So-called maternal exhaustion as an indica-

tion for forceps has practically disappeared in modern obstetrics. A clear understanding of the necessity for adequate fluid and food intake and periods of rest in prolonged labor has made the parturient patient with clinical manifestations of exhaustion a rarity.

In any discussion of the use of forceps, considerable space is usually devoted to the presentation of the advantages of certain types of the instrument and the disadvantage of others. I am in complete accord with De Lee when he stated that it is the man behind the forceps rather than the instrument that counts. The number of different types available, each with its own advocates, is so great as to approach utter confusion. My own opinion is that one should learn the advantages and limitations of one or, at most, two types of forceps, instead of attempting to become proficient in the use of many. If one accepts this view, then the instrument must be one of the several varieties that either provides axis traction or else has shanks sufficiently long to permit of simulated axis traction manually. Within these limitations, the selection of the instrument can safely be left to the practitioner's personal preference. A number of forceps have been devised for the special purpose of rotation of the posteriorly arrested occiput. Some of these possess real merit. However, it is well to remember that, when it becomes necessary to rotate occiput posteriors, the overwhelming majority of them can be rotated manually with much less trauma to both mother and child.

**A**N adequate discussion of the abuses of the obstetric forceps would exceed the limitations of this presentation. Certainly two of the most disastrous sequelae of forceps delivery are the result of the application of the forceps through a partly dilated cervix and incorrect application in relation to the position of the fetal head. These have been discussed previously and are repeated here for emphasis. One can be certain in stating that more actual dam-

age is done to both mother and child through these two errors than all others.

Other abuses chiefly depend on one's obstetric philosophy. Certain authorities have made the claim that delivery can be accomplished with less trauma to both mother and child by so-called "simple" outlet forceps than by spontaneous termination of labor. Such authorities preach and practice so-called prophylactic forceps. There are others of us who wholly agree with the statement made by one well-known obstetrician that prophylaxis means prevention; the only thing prophylactic forceps ever prevented was loss of time on the part of the physician and that is no justifiable indication for any operative procedure. So far as I am concerned, I have long since convinced myself that a well-conducted spontaneous delivery is the safest one and I truly believe prophylactic forceps like prophylactic version and extraction belongs in the class of operations best described as meddling midwifery.

Another indirect but, nevertheless, very real abuse of the forceps has come about from the excessive and injudicious use of analgesic and anesthetic drugs in labor. In the attempt to make labor painless forceps delivery is often necessary solely because the patient has been drugged to such depths that contractility of the uterine and abdominal musculature is seriously interfered with and the cooperation of the patient is completely lost. There is no doubt but that modern methods of pain relief in labor have greatly increased the incidence of forceps deliveries and the wisdom of this course is open to serious question.

It is difficult to justify the truly enormous increase in the number of forceps deliveries that has occurred especially in the last several years. When correctly used in cases where specific indications are present, the instrument is a most valuable one, but failure to realize its limitations and especially its use on questionable indications undoubtedly adds unjustifiable hazards to childbirth; its use under such conditions may constitute a veritable menace to safe and sound obstetrics.

# The Abuse of Rest as a Therapeutic Agent

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**R**ECENTLY there has been renewed interest on the part of the medical profession in problems of rest versus activity in the treatment of the sick. In the past certain great medical leaders have stressed, perhaps unduly, the importance of rest as a therapeutic measure. Three vigorous advocates of rest as a form of therapy stand out in the memory of present-day physicians. They are Weir Mitchell, Hugh Owen Thomas, and Allen K. Krause.

Mitchell's forceful espousal of the "rest cure" undoubtedly was the most influential factor in the apparent overemphasis on the importance of rest therapy in the minds of neuropsychiatrists and general practitioners of medicine. Menninger has said: "Mitchell's prestige, influence and persuasiveness were such that his 'rest cure' for the treatment of neuroses influenced American medicine for nearly fifty years."

Yet thoughtful consideration, in the light of present-day psychiatric knowledge, would tend to minimize the value of simple physical rest as a therapeutic measure in the management of the neuroses. Mitchell's conception has continued to influence the thinking of nonpsychologically minded physicians who welcomed a

plausible physiologic explanation of these baffling cases, made diagnoses of "nervous exhaustion, nervous fatigue, fatigue neuroses, nervous breakdown from overwork, nervous weakness, neurasthenia and so on," and prescribed rest cures, vacation treatment, and relaxation treatment. But Menninger has pointed out that "Modern psychiatry regards this conception of neuroses and these forms of treatment for neuroses as entirely false in theory and unsound in practice."

Similarly, Thomas has probably unduly influenced orthopedists to overemphasize the therapeutic value of rest because this great orthopedist believed that an overdose of rest was impossible and never tired of repeating: "Rest must be enforced, uninterrupted and prolonged." Yet Ghormley has emphasized the fact that modern orthopedic surgeons "realizing the detrimental effects of complete rest in bed" have succeeded in shortening the periods of such confinement with consequent improvement in the results achieved.

Finally Krause, the gifted writer on the care of the tuberculous, undoubtedly has influenced physicians to emphasize the rest treatment of tuberculosis with his oft-repeated admonition: "Rest must be first, and always first, in the treatment of the tuberculous." Yet, again, re-

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cent studies suggest that carefully graded activity may sometimes be beneficial in the management of certain patients who suffer from tuberculosis.

The doubts which are now being expressed concerning the wisdom of blind and often unreasoning adoption of unlimited amounts of rest in therapy, simply because of the support given to rest therapy by great physicians of a less enlightened age, call for a careful review of modern knowledge concerning this subject.

Blind following of the great physicians of the past has always been one of the weaknesses of the medical profession. Yet in guarding against this tendency we must not hurriedly cast aside proved and valuable methods of rest therapy.

Practically every patient presents problems of a physical and of a mental nature—problems of the soma and of the psyche. Rest or activity may be physical or mental and may produce favorable or unfavorable effects on the patient.

For purposes of prescribing rest and activity, these six factors (physical and mental, rest and activity, and favorable and unfavorable effects) can be represented schematically as is shown in the table on page 86.

Considering this table we can conceive of certain formulas which will usually hold true. For example:  $P/R +$  or  $- = M/A -$ ; that is, rest whether producing a favorable or unfavorable effect from a physical standpoint may produce mental activity which has an unfavorable effect on the patient.

Or we can conclude that in many instances  $P/A + = M/A +$ ; that is, activity which has a favorable physical effect may produce mental activity which has a favorable effect.

Often this formula will hold:  $P/R - = M/A -$ ; that is, physical rest which produces an unfavorable effect will produce mental activity of an unfavorable nature.

Finally it may perhaps be concluded that this formula will usually apply:  $P/A + = M/R +$  or  $M/A +$ ; that is, favorable physical activity will produce mental rest or mental activity of a favorable sort.

It may also be concluded that this formula



FRANK H. KRUSEN

will *not* usually apply:  $P/R - = M/A +$  or  $M/R +$ ; that is it is *not* to be expected that rest which has an unfavorable physical effect will produce favorable mental activity or mental rest.

OUR Army physicians have realized the importance of rapid restoration, both physical and mental, of sick and disabled soldiers. Their newly developed convalescent and reconditioning programs bid fair to revolutionize the concepts of physical and mental rest and activity now extant in civilian hospitals. Not only do their programs of graded physical and mental activity keep the patients in a much more cheerful mental state than before but evidence is accumulating to indicate that such programs shorten the period of physical disability and lessen the tendency to recurrence of disease.

For example, Rusk has reported the following evidence in conjunction with the convalescent training in Air Forces hospitals:



Spot checks have shown hospital readmissions reduced as much as 25 per cent. The period of convalescence in certain acute infectious and contagious diseases has been reduced 30 to 40 per cent. One hospital reported a reduction from eighteen to eleven days' hospitalization for patients with measles and a drop from thirty-three to twenty-three days' hospitalization for convalescents with scarlet fever. A recent study of 645 cases of primary atypical pneumonia, running two parallel groups, revealed that the group convalescing in the former routine manner averaged forty-five days' hospitalization with a 30 per cent recurrence. The group that was integrated into the Convalescent Training Program and carefully supervised averaged thirty-one days' hospitalization with only a 3 per cent recurrence.

SCHEMATIC REPRESENTATION OF EFFECT OF REST AND ACTIVITY ON THE PATIENT

Physical (P)	Mental (M)
Rest (R) + or -	Rest (R) + or -
Activity (A) + or -	Activity (A) + or -
Rest (R) + or -	Activity (A) + or -
Activity (A) + or -	Rest (R) + or -
Usually true	Usually untrue
P/R + or - = M/A -	P/R - = M/A + or M/R +
P/A + = M/A +	
P/R - = M/A -	
P/A + = M/R + or M/A +	
+ = favorable effect	
- = unfavorable effect	

A recent symposium on the abuse of rest indicated that rest was often harmful and activity frequently beneficial in cardiovascular disease, obstetrics, general surgery, orthopedic surgery, and psychiatric disease.

In discussing cardiovascular disease, Harrison expressed the belief that "the tendency to regard prolonged rest in bed and complete abstinence from normal economic activity" as the most important phase of management of serious forms of heart disease "may be unsound." He mentioned that John Hunter, after severe anginal attacks had developed, continued to be quite active, and lived "possibly twenty years after the onset of symptoms indi-

cating serious heart disease," and that Sir James Mackenzie "led an active and useful life for seventeen years after myocardial infarction."

Relatively few patients die of uncomplicated cardiac failure. The three great causes of death among patients suffering from heart disease are infarction of the lungs, pneumonia, and uremia. These chief causes of death tend to develop under a state of complete rest and might be prevented to some extent by mild muscular activity. The incidence of postinfarctional neurosis is decidedly greater among persons who have been kept in bed for several months than among those who have been allowed supervised activity.

When standardized myocardial injury was induced among rats under controlled experimental conditions "excessive restriction of muscular activity was harmful, while the return to normal activity within a few days seemed to exert no detectable injurious effects." These experiments led Harrison to question seriously "the validity of current methods of handling patients with the graver forms of heart disease." He concluded that "There is no proof that rest in bed carried out for many weeks after symptoms have disappeared is of value in the physical management of the patient with congestive failure, angina pectoris, or myocardial infarction."

With regard to the abuse of rest in obstetrics, Eastman concluded that "The employment of pregnant women in industrial plants was entirely feasible and safe, provided certain safeguards could be thrown about them." He also concluded that "Whatever advantage is gained by a rest period of several years between births seems to be offset and in some respects more than counterbalanced by the aging factor."

POWERS, in discussing the abuse of rest as a therapeutic measure in cases in which operation has been performed said that "Prolonged periods of recumbency in bed are anatomically, physiologically and psychologically unsound and unscientific." He thought that "Early rising from bed and walking preclude the pro-

tracted period of inertia which traditionally follows in the wake of surgery."

Powers reported his observations on the postoperative convalescence of 100 consecutive patients who were allowed to sit in a chair and to walk on the first day after major operations as compared with similar observations on an equal number of consecutive unselected patients who remained in bed for the traditional period of ten to fifteen days after operations of the same type and magnitude.

"The ambulatory patients spent 10.3 days in the hospital while those who followed the traditional convalescent program averaged 16.1 days. This represents a saving of 580 hospital bed days. . . . The average period of convalescence after early activity was 5.7 weeks; after traditional postoperative management it was 10.3 weeks." Thus the ambulatory patient "may return with comfort and safety to his usual occupation four and one-half weeks earlier than has been customary when traditional routine is followed."

The usual postoperative temperature and pulse curves were unaltered by early activity and Powers concluded: "If the temperature and pulse rate are regarded as accurate indexes of convalescence, such early activity is in no way deleterious."

There were 46 postoperative complications in the control group and only 17 in the ambulatory group of cases. Powers noted especially absence of postoperative dysfunction of the gastrointestinal tract, absence of asthenia, and striking improvement in morale among the ambulatory group of patients.

Dock, in discussing the evil sequelae of complete rest in bed, stated that in most cases they were "potentiated by anesthesia, narcotics, or other medication, or by the results of the original illness." He commented that "The effects of bed rest on the psyche are so obvious and have been so clearly described by such novelists as Tolstoi and Balzac that most laymen are well aware of this hazard of therapy."

Dock mentioned that "Bone atrophy, muscu-

lar wasting and vasomotor instability are not infrequent sequelae of bed rest, while constipation, cathartic habituation, backache, and many other chronic disabilities may appear during bed rest and persist for years or decades." He said that "Young men previously in excellent health may have pulmonary infarction within a week of an otherwise uncomplicated laparotomy or herniorrhaphy if they have been kept 'comfortable and quiet' by skilled nursing and constant medication." Dock concluded that "The physician must always consider complete bed rest as a highly unphysiologic and definitely hazardous form of therapy to be ordered for specific indications and discontinued as early as possible."

Ghormley, in discussing the abuse of rest in bed in orthopedic surgery, mentioned that an important deleterious effect of rest, from the standpoint of the orthopedic surgeon, is atrophy. "Atrophy of muscles, articular structures, bone, and skin results from prolonged rest and must be regarded as a pathologic condition." He expressed the opinion that "Much of this atrophy can be avoided by systematic massage and exercises in cases in which, for some reason or another, it is necessary to remain in bed for a long time." There is scarcely any form of disease or injury of the spinal column, pelvis, hip, or femur "in which efforts to reduce the period of rest in bed have not produced good results." Ghormley concluded that in modern orthopedic surgery "All realize the dangers of long periods of rest in bed and the effort of all forward-looking surgeons is to shorten this period."

Menninger, in discussing the abuse of rest in psychiatry, explained that "The neuroses and psychoses and other evidence of maladjustment on the part of the patient are a result of misdirected energy rather than the lack of sufficient energy." Therefore the treatment in the case of a psychiatric illness "goes beyond merely arresting any attempt at adjustment by physical exertion. It aims at the redirection of the wasted energy, the removal of the interfering inhibitions and the setting up of requisite inhibitions."

Menninger concluded: "In the sense of physical inactivity, rest has ceased to be of any importance in psychiatric phenomena. Indeed the tendency is in precisely the other direction; namely, to utilize rather than to blockade further the available energy of the neurotic or psychotic patient."

#### COMMENT

**O**BVIOUSLY it is time for us as physicians to review our conception of the therapeutic value of rest.

No thinking person would deny the great therapeutic value of rest when it is employed with discrimination, but the almost universal practice among physicians of ordering prolonged rest without discrimination is to be condemned.

A friend of mine mentioned that recently he made rounds in the hospital and asked himself as he came to each bed, "Why am I keeping this patient in bed?" He was amazed to find that in most instances he could give no rational scientific reason for keeping the patient at absolute rest in bed.

Is it not true that in many instances we keep our patients at rest in bed merely as a matter of convenience or custom?

Is it not perhaps true that we have clung too long to the habit of allowing our patients to remain completely inactive in bed, thus permitting them to become morbid and introspective and actually delaying their physical and mental recovery?

Should we not give more attention to the extreme importance of providing early graded physical and mental activity for our patients? I believe that we should.

If we civilian physicians do not do so voluntarily, public opinion, stimulated by observation of Army reconditioning programs, may force us to provide such activities.

Maj. Henry B. Gwynn, of the Reconditioning Consultants Division in the Office of the Surgeon General, has mentioned that "Reconditioning, in the simplest terms, is the scientific organization of convalescence." He pointed out

that "A well rounded reconditioning program is a method of attaining, by means of a scientifically planned schedule, a happy medium between the extreme of rest of mind and body which leads to deterioration and the extreme of activity which also leads to physical and mental damage."

Gwynn recommended a program of graded physical and mental activity in the hospital which would "change the present morbid hushed atmosphere into one of cheerfulness and gayety" with a change in the emphasis in medical thinking from "pathology to therapy." He concluded: "If such a program is adopted, it means some physical changes will have to be made in most hospitals. It entails the construction of a theatre or hall, areas for physical therapy and occupational therapy, installation of a public address system, provision of an area suitable for a library, and office space for administration. Some modern hospitals undoubtedly will even have a swimming pool and a gymnasium."

We are now finding some champions of the value of therapeutic physical and mental activity to offset the old champions of the value of rest as a therapeutic measure.

It is apparent that many physicians have abused rest as a therapeutic procedure. Let us not abuse activity as a therapeutic agent. There is a logical middle ground toward which we are now groping but we will not find it until we have shaken off the prejudices and misapprehensions of the past. For the sake of our patients we must strive valiantly to achieve a correct balance between rest and activity in therapy.

The great mistake made by physicians in the past has been that they have been prone to conclude that when a patient has passed the stage of acute illness the physician's responsibility ceases. The time is about gone when a surgeon can say to his patient, "Your stitches are out—you can go home now and when you feel strong enough, go back to work," or when the internist can say, "Your temperature is now normal, you can get out of bed and rest a while and then return to your occupation."

Physicians and surgeons must give increased attention to the scientific management of convalescence. They must remember that reconditioning of the sick or disabled person begins at the moment of disability and ends only when the patient is completely readjusted in a suitable normal activity. The management of this period of transition from sickness to health is the physician's responsibility.

I believe that each physician should make a practice of doing as my friend did and ask himself, "Why am I keeping this patient in bed?" If the answer is "I do not know," then the physician should think of the table which I have presented and consider the feasibility of providing graded physical and mental activity as compared with the advantages or disad-

vantages of continued physical and mental rest.

Keep in mind the psyche as well as the soma, and prescribe from day to day a scientific program which balances activity with rest. Do not condemn the modern ideas concerning convalescent activity simply because they seem strange and unorthodox to you.

Elbert Hubbard has said: "Man is generally down on that which he is not up on." It behooves us as civilian physicians to get "up on" the amazing new concepts concerning convalescent activity now being demonstrated in our Army hospitals. Only in this way can we escape the growing and apparently justifiable criticism that we are abusing rest as a therapeutic agent and that we are "down on" the more modern trends in medicine.



Photo from: The Bettmann Archive

Wayside diagnosis. After a painting (English School).

# Spoiled Children

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THE term "spoiled child" usually refers to an aggressive, disobedient, disrespectful youngster, whose behavior is disturbing to adults; the child obviously knows this to be true. The usual explanation is that the child has received too much attention and the commonly prescribed treatment is corporal punishment, which as you know, does no good. It is important to understand, therefore, the reasons for the misbehavior of these unhappy children and a brief analysis of a few cases will help.

The first case is that of a 9-year-old boy who was brought for examination as a behavior problem. He cried a great deal and threw temper tantrums. A few days before he was brought to the office, he threw himself on the sidewalk, kicking and crying, because his mother expressed the wish to sit in the front seat of the car on the way home from the movies, rather than in the rear seat with the patient as he wanted. The boy was doing poorly in school even though he was of high intelligence. He did not get along with other children because he would not play fairly in games.

This boy was born seven years after the marriage of his parents and was wanted very much.

His parents were very apprehensive lest something should happen to him. Being the only child in the family, he received all the attention of his parents, four grandparents, and four uncles and aunts. He was used as an emotional outlet by all of them and thus received far more affection than he needed. He was not allowed to do things for himself, being fed, bathed, and entertained by all of them. John's speech was infantile; he curved his tongue and lips in a sucking manner when he talked. He had nightmares in which he was being taken away (kidnapped).

We have in the above case an overindulged and overprotected boy, who was not allowed to grow up and do the things appropriate to his age. He remained infantile in his speech and behavior. His parents lost all control over him. He was disliked outside his home; he was an insecure, confused, apprehensive, maladjusted, and unhappy boy. His emotional needs were not met because of the parents' apprehension, and he did not develop self-confidence because he was not allowed to do things he was able to do. He was a spoiled youngster.

The second case is that of a 9-year-old boy who could not be controlled. He fought his younger brother, broke the furniture, stole money, refused to obey, threw temper tan-

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trums, made unreasonable demands, especially in the presence of guests, and fought with his associates. He was restless and disturbed his classmates in their studies. In spite of high intelligence, his grades were poor.

This boy was a restless, active baby, who was held to a strict food schedule. His mother began toilet training when he was six months of age, but he continued to soil himself irregularly until he was a year old and occasionally until 3 years of age. He wet the bed until he was nearly 4 years of age. He was a very active, curious youngster who would not obey when he began to walk and his parents felt that obedience was very important. "We have tried everything but it makes no impression on him," stated his mother.

At subsequent interviews, this boy's mother stated that she "never felt the same towards the patient as she did her other boy, who was always sweet and never caused her any trouble." His father related how he was forced to mind by a severe father and he himself did not believe in spoiling kids. We have then a patient who was at least partly rejected by his mother, and whose parents did not recognize that he was a smart, curious, alert, and aggressive boy, unable to meet the standards of behavior which they set up for him. He rebelled against these standards and, believing he was no good and not wanted, he was compelled to do things for attention for which he was punished.

The third case which I would like to summarize briefly is that of a little girl, 26 months old, who following a week in the hospital, developed crying spells during the night and temper tantrums during the day, and refused to eat or to go to the toilet; punishment had been tried but it did no good. Her mother stated that everyone felt the little girl had been spoiled by the nurses at the hospital. The child had eaten some capsules which were thought to contain a small amount of mercuric cyanide. Her mother became very frightened and rushed her to the hospital, where her stomach was washed. She was kept in the hospital for a week because of the danger of effects from the drug. During this time her mother saw her



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but twice and the child cried a great deal during both visits.

In this case the mother was instructed to give the little girl a great deal of affection, including rocking her for a couple of hours a day and especially before she put her to bed at night. The child improved within a few days and her behavior was normal within a couple of weeks. This patient, who might have been called spoiled or a tyrant, was cured of her misbehavior by a method that most people would call spoiling her.

THE reason for the behavior described in these 3 cases becomes obvious when we recognize the requirements for normal emotional growth. From birth babies require adequate food and adequate physical care in order to stimulate maximum physical growth. In an analogous manner, they have emotional needs which have to be met in order to promote nor-

mal emotional growth; they must receive an adequate amount of affection from their parents, who want them in the first place and who accept them as they are in the second place. In addition they must be allowed to grow up in terms of their own individual patterns.

The food schedule, the amount of food, the amount of affection, and the activity of babies differ, since these factors depend on the innate patterns of rhythm of the individual baby. If a child's emotional needs are not met or his individual innate patterns of growth are not recognized, he may respond by aggressive, unreasonable demands and stubborn behavior

that we call spoiled; or if from birth, the child is surrounded by apprehensive parents who use him as an emotional outlet (as in the first case), he does not grow up emotionally and becomes an infantile, unhappy, confused, apprehensive, demanding youngster whom we call spoiled. In both situations the child does not receive the security he requires and is not allowed to grow up according to his individual pattern of growth.

We can close with a point on which I am sure we all agree. An individual who receives what he needs in the world is never a tyrant. This applies to infants, children, and adults.

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## INFLUENZA VIRUS

AT a recent meeting of the Philadelphia Section of the American Chemical Society, Dr. Wendell M. Stanley spoke on the composition of influenza virus. This virus is responsible for one of the three greatest pandemics within the knowledge of man, the influenza pandemic of 1918, in which 500,000,000 persons were stricken, and 15,000,000 died. But it won't happen again, Stanley believes, because of the highly purified influenza vaccine that was developed during War II.

The influenza virus has interesting characteristics. Unlike the tobacco mosaic virus, it cannot be obtained in crystalline form, nor does it have a constant chemical composition. Apparently, this virus has certain basic components, but its antigenic structure depends upon the host from which it is obtained. Two different strains of the virus may have no immunologic relationship, and may even contain significant differences in their amino acid contents. These differences undoubtedly have arisen through the process of genetic mutation, whereby not only is the morphology of the individual cell altered, but likewise its more intimate chemical composition.

This view is of considerable academic and speculative interest, because the virus is regarded as one of the "links" between living and non-living matter. There is still some dispute as to whether a purely crystalline substance, such as the tobacco mosaic virus, can be considered "alive." Stanley's work, and others of its type, demonstrate the mutual dependence that exists between biological activity and chemical structure.

## Surgical Lesions of the Chest

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**B**RONCHIECTASIS, by definition, is a dilatation of the bronchial tubes. I am going to discuss only that type of bronchiectasis which has a childhood history, and not the secondary type acquired in the adult secondary to inflammatory disease, either pleural or parenchymatous, or secondary to tumors or other lesions in the chest.

The childhood type of bronchiectasis is of importance in many respects, first as to the onset, which is quite often shrouded in mystery. We are apt to see the child at the age of eight, ten, or twelve, with a history of a long-standing cough dating back to an indefinite time. By persistent probing of the parents we may get a history which shows that at the age of two, four, or six, or at some other early age, the child had a pneumonia (it may have been one accompanying acute exanthemata) and that since that time the child has coughed. Usually there have been no constitutional symptoms. Then at puberty, or just before, the child has a more severe attack of coughing and perhaps runs fever and has some constitu-

tional symptoms. It seems that "spitting" becomes a stylish thing around puberty, and it is noticed that the child begins to expectorate large amounts of material. Previous to that time the child may have had sputum but probably swallowed it.

Sometimes this sputum is foul smelling; other times it is not. Sometimes there is some hemoptysis; in other cases there is not. Sometimes the child is a little under par, doesn't eat well, is a little undernourished; sometimes there are no constitutional symptoms.

The question that is posed for the thoracic surgeon or for the medical man, who has seen the child and has established the diagnosis of bronchiectasis, is: "What will we do about it?"

The accompanying figures illustrate some of these points.

### TYPES OF BRONCHIECTASIS

Figure 1 illustrates diagrammatically the various types of bronchiectasis as we see them. Our knowledge of bronchiectasis really starts from the use of bronchograms back in the early twenties. Previous to that time, the diagnosis could have been guessed at from the clinical symptoms, but the ordinary x-ray rarely shows it definitely. It is only by filling the bronchial

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tree with some radiopaque substance that the structural detail can be brought out.

The structural type of bronchiectasis (Figure 2) is of some importance. The saccular type is apt to be more serious than the cylindrical type, although this is not entirely true. Clinically we can divide bronchiectasis into simple bronchiectasis in patients who have a moderate amount of mucoid expectoration with no constitutional symptoms and with very few progressive symptoms, and the foul type, where the patient has a larger amount of expectoration with odor to it. The latter type is particularly important during early youth because it makes these patients social outcasts: at school other children shun them; they may become anti-social, and these factors all may lead to certain psychological developments.

Next we have the so-called dry type of bronchiectasis in which the chief symptom is hemorrhage. This may come on out of a clear sky. Hemorrhage may be associated with the other types, but it may be the only or the predomi-

nating symptom. Hemoptysis often comes in episodes with no warning; there may be intervals of a year in between, and even after we remove the tissue we may have a very difficult time determining why the patient bled so copiously.

Finally we have the septic type of bronchiectasis in which there are the local symptoms, such as expectoration and hemoptysis and, in addition, constitutional symptoms, fever, malaise, and loss of weight.

While all those types are not absolutely differentiated, this type of classification in a general way divides the patients into the clinical types as we see them.

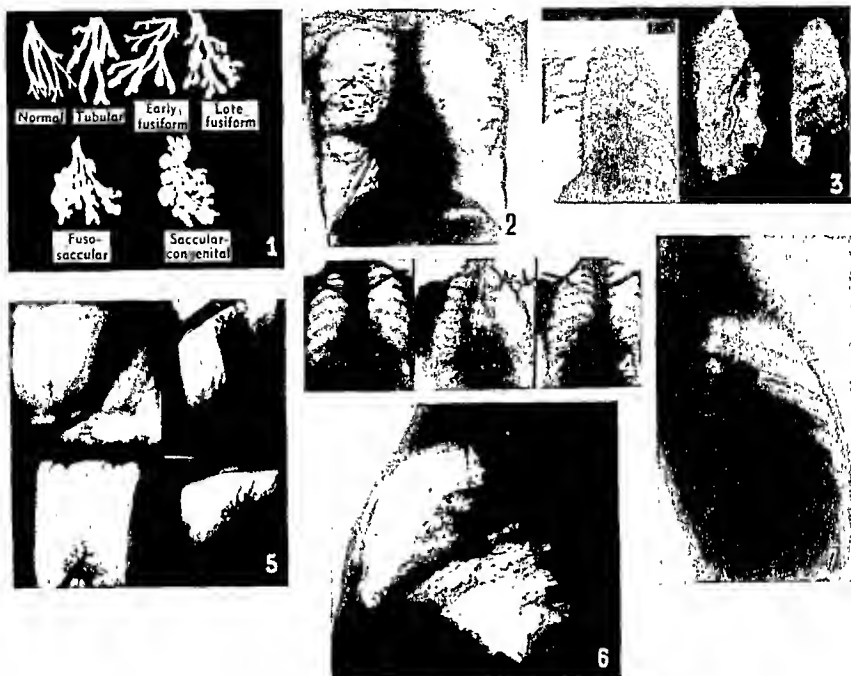
#### CASE REPORTS

Figure 3 is a picture of a boy, 17 years old, who at the age of seven had pneumonia. He had persistent cough productive of about a half cup of sputum daily, occasionally foul. He had slightly decreased exercise tolerance, but no other symptoms.

On physical examination there were a few râles at the left base, and bronchograms showed involvement of the left lower lobe and the lingula of the left lower lobe. The involvement of the lingula is very important because in about 80 to 85 per cent of the cases that have bronchiectasis of the left lower lobe there will also be involvement of the lingula of the upper lobe. If this is not removed at the same time that the lower lobe is removed, the patient will have residual symptoms.

This patient had a left lower lobectomy and lingulectomy. There is a cylindrical bronchiectasis of the left lower lobe, and lingula, and the patient has made a satisfactory recovery. This is a relatively uncomplicated type.

One thing that we have noticed regarding childhood bronchiectasis is that it rarely spreads. The patient may have great variation in symptoms and may have great variation in the amount of sputum, but, when bronchograms are done repeatedly over a long period of time, it is rarely found that the disease has spread to any other part of the lung than was



observed in the beginning. If the disease starts in the left lower lobe it usually remains there and we rarely see a progress to the right lower lobe or the left upper lobe. The patient may have repeated attacks of pneumonia with pulmonary infiltration, which clears with some scarring, but the spread of the actual bronchiectasis is rare in the childhood type. What is seen in the beginning remains so throughout the course of the disease, at least as long as it is under our observation.

The case of a young girl, 18 years old, who had measles at the age of seven, followed by persistent cough and occasional pneumonia, is shown in Figure 4. She has had foul sputum, no hemoptysis, remains somewhat underweight; she raised about a cupful of thick, greenish sputum daily; she had some clubbing

of the fingers in addition to signs of moisture in the bases of both lungs.

The bronchograms showed bronchiectasis of both lower lungs, the fusiform, saccular type of bronchiectasis.

With multiple lesions and with multiple lobes involved, the question of treatment sometimes is difficult. In this case it was decided to attack the patient's right lower lobe and right middle lobe. It was found at that time that she had not only involvement of the right lower and middle lobes, but that part of the upper lobe was involved on the right side, so that it was necessary to remove the right lower, the right middle, and part of the right upper lobes. She had a somewhat stormy course and her future, of course, is in doubt. With that much lung removed from the right side it will be

difficult to remove any lung from the left side.

In some cases where there are two lobes or even three lobes involved, we can remove these lobes at separate stages, as children have a great respiratory reserve, and in addition, great power of compensation.

A CASE of dry bronchiectasis with hemoptysis as the presenting symptom is shown in Figure 5. This patient at the time we saw him was 25 years old and had been admitted to the hospital five times with severe hemoptysis. Between these episodes of hemoptysis he felt well, though he had a slight non-productive cough. He had all the usual procedures for diagnosis. Bronchoscopy after the hemoptysis was negative, and the bronchograms showed consolidation in the right middle lobe. Tests for tubercle bacilli were negative.

The bronchogram of Figure 6 shows the right middle lobe atelectatic, but the bronchograms of the rest of the lung were negative. We did not know the source of the bleeding. On the final admission he was bronchoscoped during the hemorrhage, and it was found that the blood was coming from the right middle lobe bronchus. A local bronchogram was made of this bronchus, which showed very slight dilatation but it definitely was the source of the bleeding. The right middle lobe was removed and showed a minimal amount of bronchiectasis. However, the patient has not bled since. That was eight years ago. The pathologic examination showed a peripheral bronchiectasis of the right middle lobe without any definite source for the bleeding.

That has been the experience we have had again and again. A patient has repeated bouts of severe hemoptysis and by bronchograms we cannot determine the source of the bleeding. It is necessary in those cases to bronchoscope the patient during the bleeding episode in order to determine the source. If this hemoptysis is severe and repeated, it may be necessary to remove that portion or lobe of the lung on the basis of the bronchoscopic finding.

Upon examination of the pathologic speci-

men, we are sometimes at a loss to explain the source of the bleeding. It is much like nose bleed where there may be large dilated veins underneath the mucous membrane that will not show on the pathologic specimen.

Figures 7 and 8 show the case of a boy, 13 years old, who had pneumonia at the age of seven and had another bout of pneumonia a few years after. Following this, he developed severe cough and expectoration, with occasional hemoptysis. The sputum was foul smelling at times. He was in the hospital for several weeks with another attack of pneumonia, and just before we saw him he had rather severe hemorrhage. His exercise tolerance was definitely diminished. Sputum averaged about a cup a day. Again this is a history going back to childhood, with so-called pneumonia and persistent cough with repeated exacerbations of infection.

Bronchoscopy showed some dilatation of the right lower lobe bronchus and some purulent sputum coming from the right lower lobe. There was no evidence of foreign body at that time. Lipiodol showed a cylindrical saccular bronchiectasis of the right lower lobe.

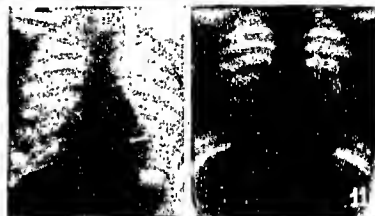
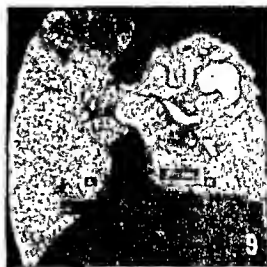
He had a right lower lobectomy. The specimen showed marked dilatation of the bronchi, but much to our surprise, in one of the distal bronchi there was a little piece of Christmas tree which this child at some time in the long history had aspirated. Whether this was the cause of the bronchiectasis, we do not know because there was no memory on the part of the child or the parents as to when this might have happened.

We must always be on the lookout for foreign bodies as the contributing factor or as the primary factor in bronchiectasis.

#### PROGNOSIS

Very rarely do we have a patient come into the chest clinic over the age of forty with a childhood history of bronchiectasis.

Spontaneous cures of this disease, we feel from our observation, are rare, so either these patients have become so accustomed to the dis-



ease that they do not come to the clinic or they have died. If they have died, of what did they die? We must assume that those who died probably were classified as pneumonia at the time of death. They had a severe pneumonia that did not respond to ordinary therapy, and were so classified. How frequently that happens is hard to say, but it must be fairly common. On the basis of our present knowledge we would have to give a very guarded prognosis, as to length of life, to any individual with a childhood history of bronchiectasis.

This is of importance in considering the treatment of these patients. We know that they can

be symptomatically improved by postural drainage, by the temporary control of infection, the use of penicillin and streptomycin, the use of aerosol and various other forms of inhalation, and with these measures some of them can be kept under control for a considerable period of time. These drugs are particularly important during acute episodes and periods of infection. You cannot, of course, cure bronchiectasis in this way, because it is a structural deformity at the time we see it and we cannot bring the bronchi back to normal.

The symptoms in bronchiectasis can change very quickly. There is no disease that I know

of where patients can be so well one day and so sick the next, due chiefly to retention of sputum or to hemorrhage. It is a very unpredictable disease. Seeing the patient at any one time, we are unable to predict what that patient's condition will be a week hence. This makes it very difficult to advise parents regarding the treatment of the disease. We do know that lobectomy in cases that are limited to one or two lobes in children carries a very low mortality rate, and a very low morbidity rate in the child. The operation has practically no effect on the vital capacity or exercise tolerance. As the patients get older, the mortality risk increases, and the compensation is not so complete.

The specimen of a little girl whom we observed over a long period of time is shown in Figure 9. The patient was 7 years old when she was first admitted in 1931. There was no previous illness until four weeks before admission, when she began having fever, slight hemoptysis, and cough. She was in the hospital for 285 days. She came back with persistent low-grade fever and persistent cough. Bronchoscopy showed pus coming from the right main stem bronchus. X-ray showed diffuse cloudiness of the right lung, finally with some clearing at the base, and persistent atelectasis of the upper lobe on the right. Diagnosis at that time was lung abscess and bronchiectasis. Lipiodol fillings were not successful.

She was readmitted six years later. Following her previous discharge, the patient had been well until two weeks before this admission, when she developed a chest cold and mild cough. At five o'clock of that day she had severe hemoptysis, the hemorrhage continuing in the hospital in spite of transfusion, and on the day following she had hemoptysis of one to two ounces and suddenly stopped breathing.

That child was observed, off and on, over a period of six years and died suddenly. It can be seen that the lung is practically destroyed. It consists of a spongy network of tissue filled with a blood clot. After her initial illness this child went on for some six years in moderately good health and then had this dramatic exodus with hemorrhage.

## PATHOGENESIS

THE remaining illustrations show some aspects of the pathogenesis of bronchiectasis.

Figure 10 is of a girl, 12 years old, who was first seen in 1930 with cough and expectoration. She had had pneumonia four years previously. In 1930, the first films showed atelectasis of the left lower lobe. The film shows the triangular shadow, with clearing eight months later. In 1931 she had the same phenomenon, with later clearing.

The same phenomenon is seen in Figure 11—atelectasis, with clearing seven months later.

In February, 1934, the bronchograms were done (Figure 12) showing incomplete re-expansion of the left lower lobe, but no true bronchiectasis. The patient at present has no symptoms. We have here a patient who had episodes of atelectasis of the lower lobe without the development of true bronchiectasis. However, there is an incomplete re-expansion of the left lower lobe. This patient has not been x-rayed since 1934, but she has been seen in the clinic and has had no symptoms.

Figure 13 is of a patient who was 12 years old when first seen. She had cough, purulent expectoration, and bronchoscopic drainage. In 1925, again atelectasis of the left lower lobe is shown, with re-expansion soon afterward. The cough persisted during this time, and a film made in 1933 (Figure 14) shows marked bronchiectasis of the left lower lobe.

I believe this phenomenon of atelectasis and either expansion or lack of expansion may be a very important thing in the pathogenesis of bronchiectasis. I believe if children were x-rayed routinely after pneumonia and if, in all cases of atelectasis, a persistent effort were made by bronchoscopic drainage, postural drainage, and encouragement of cough to re-expand that lobe, in some cases development of bronchiectasis might be prevented.

I can just say in closing that bronchiectasis in childhood is a serious disease that many times is not recognized, and the only definitive treatment we know now in selected cases is lobectomy.

## Diseases Commonly Confused with Acute Coronary Occlusion

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**D**URING the past ten to fifteen years coronary artery disease has received much emphasis in medical literature. At the present time the average physician considers the possibility of coronary disease whenever he is confronted by a patient complaining of pain in the chest or by a patient in circulatory collapse. Even the patient, in this enlightened day, is familiar with the prognostic implications of acute coronary occlusion.

When a diagnosis of acute coronary occlusion is made, a period of four to six weeks of bed rest is usually required, with a total period of about three months before full activity is resumed. All of us know that cardiac neurosis frequently complicates acute coronary occlusion; it is obvious that such a neurosis may complicate a mistaken diagnosis as well as an accurate one. It behooves us, therefore, not to make this diagnosis without reasonable proof that it is correct.

Most physicians recognize acute coronary occlusion with creditable accuracy. Today it is probably fairly uncommon for coronary occlusion to escape the attention of the doctor. We have reached the place, however, where the

diagnosis is made too frequently. Unfortunately, the diagnosis of coronary occlusion often is made in patients with normal hearts. Oftentimes the diagnosis is made in people who have curable or unimportant diseases which are followed by no disability and require no bed rest. An incorrect diagnosis under such circumstances may precipitate great anxiety and lead to much loss of time and income.

All of us have heard a great deal about variations in the typical histories presented by patients with angina pectoris or coronary occlusion. We have heard also of many variations in the usual electrocardiographic patterns, so much so that we are tempted to make the diagnosis in a number of patients whose histories and electrocardiograms bear only a superficial resemblance to acute myocardial infarction. It is perfectly true that there is a wide variation in the histories obtained from such patients, but the doctor should consider other diagnostic possibilities whenever the history deviates from the typical one. It is particularly important to consider other possibilities when the electrocardiogram fails to provide full proof that myocardial infarction has occurred.

Let us review the typical histories given by patients who have angina pectoris or coronary artery occlusion. Most of you are perfectly

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familiar with the things I am going to say about these two disorders.

#### ANGINA PECTORIS

Angina pectoris is ordinarily precipitated by physical effort or emotion. The pain is situated in the retrosternal area, behind the upper, middle, or lower portions of the sternum. The use of the term "precordial" in describing the location of the pain in angina pectoris is to be discouraged, as pain in the region of the apex of the heart usually has an origin other than in the coronary arteries. Radiation, when it takes place at all, is likely to be to one or both sides of the neck as far as the angles of the jaw, to one or both shoulders, or to one or both arms. Radiation to the arms is likely to involve the ulnar aspect, sometimes traveling as far as the little fingers. Ordinarily the pain does not radiate to the back, although there are a number of exceptions to this rule. The pain behind the sternum has a distinctive quality and is one of oppression, tightness, or fullness; it is sometimes a crushing pain and sometimes a burning one. It is not a sticking or stabbing sensation.

The pain is by no means necessarily severe. Most of us get the impression from textbooks that the pain is about as severe as the human being can bear. Many patients, when the doctor refers to their discomfort as pain, will correct him and say, "Doctor, this not a pain at all; it is just a sensation of tightness in my chest."

Again from the textbooks one gets the impression that the pain of angina pectoris strikes with full intensity at the onset. This has been notably not the case among patients I have questioned in detail. Almost invariably the pain begins very gradually, increases gradually over a period of a few seconds or a minute or so, then reaches its maximum intensity and strikes a plateau on which it continues until the patient stops the effort which precipitated it. Subsidence, like the onset, is gradual. Ordinarily pain lasts for a period of one to three minutes, sometimes as long as five. It is not a momentary pain; neither is it prolonged. It is

important to remember, however, that a patient suffering fairly severe pain may lose his appreciation of time so that he will occasionally describe a pain lasting one minute as having a duration of five or even ten minutes.

Upon subsidence of the pain of angina pectoris, the patient returns to his previous state of well-being and is none the worse for having experienced it. This is in sharp contrast to the patient who has suffered closure of a coronary artery.

The electrocardiogram is ordinarily normal in patients with angina pectoris who have not yet suffered from myocardial infarction. If an electrocardiogram is made during pain, however, one frequently sees transitory depression of the RST segments with prompt return to normal as pain subsides.

#### ACUTE CORONARY ARTERY OCCLUSION

The pain in acute coronary occlusion is identical in location, radiation, quality, onset, and offset to the pain of angina pectoris. It is likely to be more severe, but again the sensation may be simply one of pressure in the chest. The pain is prolonged in contrast to angina pectoris, lasting twenty or thirty minutes, an hour, several hours, or even a full day. One can be reasonably certain that a patient with angina pectoris who develops an identical but prolonged pain lasting one-half hour or more has suffered obstruction of a coronary artery. Physical exertion is not an important factor in the precipitation of acute coronary artery closure. Whether the patients are awake and working, awake and resting, or asleep in bed has little bearing on the frequency with which coronary occlusion begins.

**A**FTER acute coronary occlusion the patient, in contrast to the patient with angina pectoris, does not ordinarily return to his previous state of well-being. If his attack is a severe one, he will develop weakness, sweat, and sometimes nausea and vomiting. His blood pressure is likely to fall and he may go into shock. His

heart rate is usually increased. He develops fever, leukocytosis, and acceleration of his sedimentation rate. He is practically certain to develop serial electrocardiographic changes which are diagnostic of acute myocardial infarction. These changes are about as pathognomic of infarction of the heart as anything in medicine comes to being pathognomic. It is most wise not to be tempted to read myocardial infarction into an electrocardiogram showing only minor variations from normal.

There is an important exception to what we have said so far regarding the duration of pain in angina pectoris. During recent years we have become familiar with the fact that about half of the patients during the few days or weeks preceding acute coronary occlusion develop premonitory symptoms in the form of an increase in the frequency, severity, ease of precipitation, and duration of their anginal pain. Under such circumstances the pain may occur even at rest and may last for ten to twenty minutes at a time. Studies during this period will fail to reveal proof of infarction of the heart until a major episode takes place.

#### ACUTE PERICARDITIS

In the past ten years we have learned much about the clinical and electrocardiographic characteristics of acute pericarditis. Much of this knowledge is due to Dr. Arlie R. Barnes of the Mayo Clinic. It is important to recognize this entity since much of the acute pericarditis we now see is of the so-called benign type complicating respiratory infections. This type of pericarditis ordinarily is fibrinous and not followed by pericardial effusion or pyopericardium. Recovery is complete and leaves no cardiac or other disability. It is most important not to make the diagnosis of coronary occlusion when this benign and self-limited disease exists.

Fairly frequently patients with benign pericarditis experience severe anterior chest pain beginning during or a few days after a respiratory infection. The infection may be a mild one in the form of a simple sore throat or a cold. Pericarditis may, of course, complicate more

serious respiratory infections such as pneumonia. The pain is likely to be situated in the retrosternal area and may at times closely resemble the pain of acute coronary occlusion. It may even radiate through the usual pathway. Usually a pericardial friction rub is heard, and this may be erroneously taken as confirmation of a diagnosis of acute coronary occlusion with anterior myocardial infarction. Usually fever, leukocytosis, acceleration of sedimentation rate, and serial electrocardiographic changes are present.

WHEN pain is a part of the syndrome of acute benign pericarditis, it is likely to be the initial symptom of the complication and to attain its full intensity at the onset. Very frequently there is an inspiratory increase in pain, as in pleurisy, which is probably due to adjacent pleuritis; this inspiratory increase in pain, as well as the sudden onset, may help in differentiating it from acute coronary closure. It is rather common for the pain of pericarditis to be radiated through to the interscapular area; we have emphasized that this is usually not a feature of acute coronary occlusion.

The pericardial friction rub deserves some mention. After anterior myocardial infarction the friction rub, if heard at all, is likely to be heard on the second, third, or fourth day following coronary closure. In patients with acute pericarditis the friction rub is likely to be heard when the patient is first seen by the physician, even during the early hours of the pain; this is an important differential point.

Although the electrocardiogram bears a superficial resemblance to that of acute myocardial infarction, there are many important differences. In the acute stage the RST segments are likely to be elevated in all leads, rather than showing reciprocal elevation and depression in leads 1 and 3 as in the case of acute myocardial infarction. Later in the course of pericarditis, inversion of the T-waves in all leads is likely to occur. Ordinarily there is no alteration of the QRS complexes in acute pericarditis except that there may be slight lower-



ing of voltage; characteristic Q-waves do not appear as in the case of myocardial infarction.

#### PULMONARY EMBOLISM

Pulmonary embolism is frequently diagnosed as acute coronary occlusion. Although the predominant symptoms and signs of massive pulmonary embolism are dyspnea, cyanosis, and circulatory collapse, oppressive pain behind the sternum may be a feature in patients able to give a history. After a few days when pulmonary infarction has followed, the pain is likely to be on one side of the chest and to be inspiratory in nature.

In patients who have nonfatal pulmonary embolism, there is likely to be fever, leukocytosis, and acceleration of the sedimentation rate. The electrocardiogram frequently shows characteristic changes, which again superficially resemble those of posterior myocardial infarction. There are important differences, however, including a prominent S-wave in lead I and inversion of the T-wave in lead 4F. The large Q-wave and inverted T-wave in lead 3 is rather similar in both conditions, but the differences should make the diagnosis apparent.

Of great importance in the recognition of pulmonary embolism is a history of preceding phlebitis, varicosities, a surgical operation, usually in the pelvis, trauma to the legs, and pregnancy. All of us know that an interval of nine or ten days is likely to elapse between pelvic surgery or delivery before pulmonary embolism occurs, yet too often this fundamental fact is overlooked.

#### PREMATURE BEATS AND PAROXYSMAL RAPID HEART ACTION

Brief mention should be made of premature beats or extrasystoles as a cause of anterior chest pain. Especially in nervously sensitive people, premature beats may be associated with a momentary, sharp, sticking, or stabbing pain usually located near the apex of the heart. Occasionally radiation takes place to the left shoulder and arm. An important point is that the

pain is momentary and does not last the one to three minutes usual in angina pectoris. One may get a confusing history of the duration of pain, however, as the momentary stab is frequently followed by a variable period of precordial aching, usually situated near the apex and lasting for a few minutes or even all day in an unusually sensitive person.

Quite frequently patients with paroxysmal tachycardia, paroxysmal auricular flutter, or paroxysmal auricular fibrillation have discomfort in the front of the chest. Usually the discomfort is not particularly painful, but it may be a sensation of oppression or fullness behind the sternum. If the rate is rapid and long sustained, the patient may go into circulatory collapse; he may become pulseless, may have no obtainable blood pressure, may develop a cold, clammy sweat, and may present a picture closely approximating that of acute coronary occlusion.

Occasionally patients with paroxysmal rapid heart action are entirely unaware of the fact that the heart is beating rapidly. Such a patient, complaining of anterior chest oppression and presenting the picture of circulatory collapse, may easily be regarded as having acute coronary occlusion.

It is most important to recognize paroxysmal tachycardia because of its frequent occurrence in hearts that are structurally normal. Appropriate treatment may prevent subsequent paroxysms and permit the individual to lead a perfectly normal life.

#### NEUROCIRCULATORY ASTHENIA AND CARDIAC NEUROSIS

Patients with neurocirculatory asthenia or cardiac neurosis frequently describe anterior chest discomfort which may confuse the doctor. Ordinarily the pain is situated about the left breast near the apex of the heart and is not in the retrosternal area. The discomfort is usually prolonged, lasts for hours at a time, and is unaltered by physical exertion. Frequently it is associated with precordial tenderness, a rare finding in the patient with angina pec-

toris or coronary occlusion. Such patients usually complain of excessive fatigue despite adequate rest, and may present symptoms and signs of vasomotor instability such as tachycardia, dizziness, faintness, and variations in blood pressure.

#### HYPERVENTILATION SYNDROME

Patients with the hyperventilation syndrome and normal hearts frequently are diagnosed incorrectly as having coronary occlusion. This syndrome is probably always a part of an anxiety neurosis. The predominant symptom is one of breathlessness which occurs without any close relationship to physical exertion. Sometimes the breathlessness is extreme and is described as suffocation, inability to draw the breath all the way down, or gasping. In occasional instances the degree of hyperventilation is so slight that the patient is not conscious of his overbreathing, or it may take the form of sighing respiration.

Pain in the front of the chest may be a part of the symptomatology of such patients. Usually the pain is situated about the left breast or in the left pectoral region and frequently takes place in the form of repeated spasms or grabbing sensations. Occasionally the pain may so closely resemble that of acute coronary artery occlusion as to be indistinguishable.

There are always other symptoms and signs of the hyperventilation syndrome when an adequate history is taken. Detailed questioning will reveal the presence of an anxiety neurosis. The breathlessness differs from that of true cardiac dyspnea in that it is unrelated to effort and is almost never associated with wheezing or coughing. Other symptoms are lightheadedness, dizziness, faintness, fainting, spots before the eyes, numbness and tingling about the lips and in the fingers, tachycardia, heightened muscular irritability, hyperactive reflexes, tenseness in muscles, tremulousness, and, when the symptoms are fully developed, carpopedal spasm with positive Chvostek and Trousseau signs.

Patients who hyperventilate frequently have

marked electrocardiographic alterations in the form of lowered T-waves and sometimes there is complete inversion involving all leads. The electrocardiogram returns to normal as the attack subsides, but the abnormalities may be reproduced later by directing the patient to hyperventilate.

#### OTHER DISORDERS

Patients with such disorders as cervical rib, scalenus anticus syndrome, and compression of sixth cervical intervertebral disc commonly describe pain on the lateral aspect of the neck, frequently spreading to the side of the head, the shoulder, and even down the arm. Sometimes the pectoral region and scapular area are involved. Retrosternal pain is rare. A confusing history may be obtained from the patient who says that his pain is induced by such effort as walking. Close questioning will usually show that at such times the patient is carrying a weight in the hand on the affected side, thus increasing the tension on the brachial plexus and inducing pain. Digital pressure over the scalenus anticus muscle will ordinarily reproduce the typical pain in a patient with this syndrome. X-ray study should reveal the presence of a cervical rib. Patients with compression of the sixth cervical disc frequently have radiation of pain to the thumb and index finger, rather than down the ulnar side of the arm as in the case of angina pectoris. The injection of lipiodol into the spinal canal may be necessary to make a diagnosis of compression of the disc.

**P**ATIENTS with subdeltoid bursitis are occasionally diagnosed as having coronary occlusion. Pain is usually most intense over the subdeltoid bursa but frequently spreads as far as the neck, scapular area, pectoral region, and down the arm. Usually there is tenderness over the subdeltoid bursa. The obvious limitation of motion of the shoulder should give a clue to diagnosis.

Many of you have had spasm of the cardiac

end of the stomach or lower portion of the esophagus when under great nervous strain. Often the discomfort follows the drinking of cold liquids. The discomfort is usually situated over the xiphoid process and lasts for fifteen to thirty minutes or more. It is not precipitated by effort and lasts longer than angina pectoris. Frequently there is a history of dysphagia at such times.

Patients with herniation of the cardiac end of the stomach through the esophageal hiatus occasionally give a history resembling that of acute coronary occlusion. I once saw a doctor who had had severe pain over his xiphoid on several occasions; he described his condition in a way that made me believe he had suffered acute coronary occlusion despite the fact that serial electrocardiograms were normal. On one occasion I had the good fortune of seeing him during pain, at which time he had tympany where one would expect to find precordial dullness. This clue led to gastrointestinal x-rays which revealed a hiatus hernia with displacement of the heart. His rapidly developing cardiac neurosis was thus dispelled.

#### CONCLUSION

This discussion makes it apparent that there are many conditions capable of producing an-

terior chest pain or circulatory collapse thereby suggesting the possibility of angina pectoris or acute coronary occlusion. Many of them are relatively unimportant diseases, curable diseases, or diseases which should produce no disability. This list is not a complete one. It is most important to observe that the differential diagnosis may in almost every instance be made entirely on the basis of the history.

In these busy days there is a great tendency on the part of the doctor to take the chief complaint of his patient and then, without going into the history in detail, order such laboratory work as x-ray of the heart, electrocardiogram, blood count, and sedimentation rate. The electrocardiographic interpretation may be returned to the doctor with some such nondescript term as "myocardial damage." The doctor then accepts this as evidence of heart disease, institutes treatment, and never takes a full history.

Let me emphasize the importance of a complete history before laboratory studies are made. Let me emphasize again the fact that, although there are variations in the typical histories presented by patients with angina pectoris and coronary occlusion, the histories usually are reasonably typical. When the history varies from the expected one do not make a diagnosis of coronary disease without adequate proof. Remember that a cardiac neurosis may be as disabling as coronary occlusion itself.

## DIAGNOSTIC CLINIC

# Procedures in Office Urology

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### THE ENDOCRINE MANAGEMENT OF CARCINOMA OF THE PROSTATE

THIS discussion of the endocrine management of carcinoma of the prostate is based upon observations of approximately 50 patients who had satisfactory follow-up examinations.

The oral administration of stilbestrol in general is quite satisfactory, but at the onset of treatment it may be advisable to administer the drug parenterally to assure a prompt response. This has some advantage through obtaining a better cooperation of patients. Most male patients tolerate this drug very well; in a few instances, however, there has been evidence of hypersensitivity to the drug, and here it was discontinued and orchiectomy performed. A few patients have had some gastrointestinal disturbance but usually not sufficient to require discontinuance of the drug, but merely reduction in dosage. Occasionally patients complained of pains in the extremities resembling a mild peripheral neuritis. Thiamine chloride was administered for this condition. Patients should be cautioned not to take mineral oil or any other oil-base laxative since the drug is oil soluble, and consequently may not be absorbed

adequately. We feel that it is necessary that there be some degree of gynecomastia as an assurance that the endocrine effect is being obtained. Gynecomastia is not an indication for reduction of dosage unless extremely severe.

The dosage of stilbestrol has been 3 mg. daily for a period of two to three months, given in divided doses (1 mg. t.i.d.). The dosage is then reduced to 2 mg. daily for an indefinite period. However, in the presence of intolerance it may be reduced to 1 mg. daily temporarily. In general, should patients not be able to tolerate 2 mg. daily for long periods, orchiectomy is indicated.

The general results from stilbestrol administration are as follows: 90 per cent, temporary improvement; 60 per cent, improvement sustained for six months to one year and then relapse; 20 per cent, improvement for twelve to twenty-four months and then relapse; 10 per cent, sustained improvement from twenty-four to thirty-six months. When orchiectomy was performed following a relapse after stilbestrol therapy, about 15 per cent showed slight improvement, but usually for only a short period of time.

Dr. Kiefer and I began the use of stilbestrol for carcinoma of the prostate in our clinic at the University of Illinois in 1940.

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The relief of pain, gain in weight, and general improvement have been extremely satisfactory in many instances, and where such improvement has been sustained, the patients are working and otherwise leading a normal life as far as their general activity is concerned. Some degree of testicular atrophy can generally be noted and usually there is complete impotence. Favorable results are usually associated with stabilization or recession of the primary growth, even to the extent that the growth is sometimes no longer sufficiently indurated to appear typical of carcinoma of the prostate on rectal palpation. Those patients who had obstructive symptoms with residual urine were submitted to transurethral resection, the method recommended by most urologists for carcinoma of the prostate. As obstructive symptoms recur, resections are repeated.

Incidentally, at the onset of our investigation we tried stilbestrol for benign hyperplasia of the prostate without any clinical or cystoscopic evidence of improvement.

Our conclusions concerning the present status of endocrine treatment are:

1. Treatment is palliative rather than curative.
2. No previous therapy is as favorable as estrogen therapy or orchiectomy.
3. The advantage of orchiectomy over stilbestrol is insignificant and, in general, stilbestrol therapy is advisable after orchiectomy.
4. Symptomatic relief of pain after either therapy for variable periods of time warrants such medication at present.
5. Except for relief of pain, in our experience, metastatic lesions have not been favorably influenced.

#### DISTURBANCE OF URINATION IN WOMEN

Dr. Earl Ewert and I became interested in disturbance of urination in women about eighteen years ago, and established a clinic at the College of Medicine, University of Illinois. Since that time there have been close to 1500 new admissions to this clinic (1944).

There should be a definite routine technic for



RUSSELL D. HERROLD

the examination of women with disturbance of urination. First, there should be external inspection for the presence of caruncle, periurethral ducts, Skene's glands, and the degree of urethrocele or cystocele if present. Since voided specimens are of very little value as a means of obtaining information for urologic evaluation, catheterization should be done to obtain specimens for microscopic or cultural studies or both. The danger of infection through catheterization is insignificant; if patients give a history of so-called instrumental fever, this can usually be avoided by the administration of sulfathiazole or sulfadiazine for twenty-four hours prior to catheterization. The normal caliber of the urethra in women is between 28 to 30 F., so if at the time of catheterization the urine is found to be grossly clear, sounds may be passed to determine at what size there is firmness or gripping. It is preferable to use straight sounds in women, but if these are not available, then the ordinary Van Buren sounds used in men are quite satisfactory.

Cystoscopic examination should be done if indicated. As regards roentgen-ray studies, intravenous pyelograms are preferable to flat plates. In addition to the information that may be obtained from a flat plate, such pyelograms frequently give some indication of the relative function of each kidney as well as important leads for retrograde pyelography if that should be found necessary at a subsequent date.

THE triple syndrome of contracture of the urethra, urethritis, and trigonitis is exceedingly common. Gradual dilatation of the urethra should be done followed by the instillation of silver nitrate in dilution of 1:800 to 1:100. This solution is retained for only a few seconds after which it is permitted to drain and the catheter is removed. In most instances this treatment gives relief, which is, however, not permanent but may vary from a few weeks to several months. The patients are instructed to return for treatment upon the appearance of the first symptoms of a recurrent irritability. The instillation of silver nitrate can best be described as an in-and-out method, since the catheter is left in place for a few seconds and after drainage some of the silver nitrate will medicate the urethra as the catheter is withdrawn. Although it seems that trichomonad infestation of the urethra can produce some irritability just as in vaginitis, they apparently are not pathogenic for the interior wall of the bladder.

Cystocele or urethrocele of moderate degree may respond favorably to the above treatment, but such response is temporary in most cases and plastic repair is usually indicated except in very old patients or poor surgical risks. Other conditions quite commonly seen, such as polypoid growths in the urethra or neck of the bladder, require fulguration through transurethrosopic or transcystoscopic manipulation.

The symptoms of interstitial cystitis (Hunner's ulcer) are almost constant enough to be diagnostic. The presence of a low bladder tolerance, usually 4 to 6 ounces, together with a grossly clear urine is strongly suggestive of

this condition. Cultures of the urine are generally sterile, and microscopic studies may show a few blood cells but otherwise are negative. When the capacity of the bladder has been reached there is extreme urgency of urination and pain if not immediately emptied. Although the etiology of this condition is not known, it is more commonly seen in women (approximately 90 per cent) and most often during or after the third decade in life. The common conditions from which it has to be differentiated are tuberculosis and early malignancy of the bladder. Of the many other names for this condition, one of the earlier ones, elusive ulcer, is significant because the condition is difficult to see cystoscopically. Another synonym, solitary ulcer, is misleading because it is more frequently multiple than single.

The silver nitrate treatment appears most efficacious at present, but relief is temporary rather than permanent. While the pain and irritability following silver nitrate treatment is quite severe for twenty-four to forty-eight hours, most patients will return for a like treatment because of the ultimate relief from distress, even though temporary.

Silver nitrate may be administered by one of two alternate methods: (1) by the instillation of the stronger solution ( $\frac{1}{2}$  to 1 per cent) retained for five minutes, preceded by instillation of a local anesthetic (nupercaine 1:250 is quite satisfactory); and (2) irrigation to capacity with a more dilute solution of silver nitrate (1:1000 to 1:2000 in distilled water) also preceded by a local anesthetic. This method has added value because it distends the bladder and is also less discomforting for the following twenty-four to forty-eight hours.

#### INFERTILITY IN THE MALE

Infertility in the male is in a rather unsatisfactory status as regards any beneficial measures, but I thought a few points in evaluating these conditions would be quite worth while. Every urologist has had a decided increase since Pearl Harbor in the number of patients requesting examinations for sterility. It is generally

accepted that the male is at fault in approximately 50 per cent of sterile marriages. The semen may be deficient in various ways—commonly, absence of spermatozoa, a low count, decreased period of viability, or a high per cent of abnormal forms.

No spermatozoa in the semen may be due to bilateral obstruction somewhere between the secreting ducts of the testes and the ejaculatory ducts in the posterior urethra. Spermatogenesis may be at fault, such as that following bilateral orchitis associated with mumps. There are many other causes of faulty spermatogenesis of unknown etiology. These cannot always be differentiated from those due to obstruction without a biopsy of the testicular tissue. It is not at all unusual to see specimens which only have an occasional spermatozoa but sufficient to prove that at least one duct is patent.

THERE are certain factors in connection with the laboratory tests of seminal fluid which are worthy of emphasis. Specimens delivered to office or laboratory in condoms are not satisfactory except for spermatozoal count. The normal count is one hundred million or more per cubic centimeter. The normal period of viability is shortest at body temperature, longer at room temperature, and longest in the ice box. Specimens transmitted in cold weather should be warmed to room or body temperature before examination.

The chief practical point in these observations of seminal fluids is that specimens need not be kept warm after collection while being delivered to the office or laboratory for examination. The important thing to remember is that these specimens, when delivered cold, should stand at room or body temperature for an hour or two before examination.

Since no specific cause of infertility is known at present, there is no specific treatment. The various vitamins (E, C, B complex, and more recently D) that have been reported as important in increasing spermatogenesis have been tried singly and in combination without any satisfactory evidence that any one is consistent-

ly helpful. However, I believe it is well, at the present time, to give these patients some reliable, balanced vitamin and mineral combination. As regards the endocrine therapy, I have seen fertility follow the administration of either gonadotropic hormones or pregnant mare's serum, but not consistently, so that it is difficult to evaluate them. It has been reported that the male hormone, testosterone, may temporarily depress spermatogenesis. I think that thyroid extract is of value in over-weight patients, particularly if they have a minus basal metabolism.

#### OFFICE TREATMENT OF GONOCOCCIC INFECTIONS WITH PENICILLIN

The chemotherapeutic advances in the treatment of gonococcic infections since the introduction of sulfanilamide have necessitated frequent revision as more effective derivatives became available.

Our series of penicillin treatment for gonococcic infections is based upon only 40 patients, but intensive tests of cure have been made. A high cure-rate can be obtained through the administration of 100,000 Oxford units of penicillin given over a short period of time. I have followed the method first described by Dr. C. Philip Miller and his co-workers. As an example, 25,000 units were given intramuscularly at 1 P.M., followed by like dosage at 2 P.M., 4 P.M., and 6 P.M. So far no failures have been seen following the above method. However, patients who fail of cure on penicillin in the above dosage may require hospitalization for a sufficient period to enable successful administration of larger dosage over a longer period of time. A trial of the above schedule would seem to be the method of choice, reserving more intensive treatment for those not cured by a smaller amount.

There have been no failures in a small series of patients by the five-hour method of administration of penicillin. In all instances adequate courses of sulfathiazole or sulfadiazine had proved ineffective prior to the use of penicillin. Reports in the literature have listed failures varying from 1 to 10 per cent in series

of 100 or more patients. Most of such failures have been reported as cured when a second course of penicillin was given, usually 200,000 units, distributed over a longer period of time. It is likely that the latter total dosage might be distributed over an office day of eight or nine hours before resorting to hospitalization. This drug is excreted very rapidly so that twelve to fifteen hours after an injection of 25,000 units there is very little, if any, antibacterial substance in the urine. Therefore, after an overnight lapse of treatment, an injection the following morning would be like starting a new course.

Tests of cure in general practice are best made by sending the patient to a competent laboratory rather than by attempting to collect and transmit specimens for culture. It is particularly desirable in women that cultures should be made since smears are not reliable. After penicillin therapy a few days should elapse before the first culture is taken. Two subsequent cultures should be taken, at least one following menstruation.

Frequently the urethral discharge does not disappear immediately, but becomes more mucoid and scanty, day by day. If it persists for longer than one week, the prostate should be checked and if it is infected with other bacteria, suitable treatment should be administered. Likewise, the urine may remain slightly hazy for a few days after gonococci have been eradicated. Occasionally, local treatment is advisable at this time.

#### NONSPECIFIC INFECTIONS OF THE URINARY TRACT

Our studies on nonspecific infections of the urinary tract cover many years of observing the use of all the sulfonamides and other prior antiseptics, and, more recently, penicillin.

Typical of acute infections that respond to sulfonamide therapy are those due to one or the other of the various coliform bacteria and are more generally seen in women and female children. Dosage on the order of 4 gm. daily in adults should be administered for a period of five days, then reduced to 3 gm. daily for a total period of seven days in order to assure

bacteriologic cure. Suitable tests, either by microscopic or culture methods, should be made following a lapse of about one week after the discontinuance of sulfonamide therapy.

The onset of these infections is frequently sudden with symptoms of frequency of urination, dysuria, and hematuria, and with or without elevation of temperature. In general, the symptoms are not unlike those of acute gonococcal infections in women, from which they must be differentiated. Usually they are not complicated by other diseases of the urinary tract, and if cure is prompt, cystoscopy or examination of the upper urinary tract is not indicated.

This type of acute infection with the coliform bacteria is unusual in the male. Here, more often, it is an acute manifestation of a chronic infection following instrumentation or it is associated with various conditions producing residual urine and numerous other causes of chronicity, such as calculus disease, tumors, and abnormalities of the genitourinary tract.

Patients with chronic infections or with acute exacerbations of such infections usually give a history of previous episodes and often reveal symptoms suggesting other associated pathologic conditions of the urinary tract. Invariably, sulfonamide therapy gives only temporary relief of the clinical symptoms and some clearing of the urine. After the drug is discontinued, gross pyuria or bacteriuria returns with recurrence of symptoms. However, these chronic infections may be more or less without symptoms for long periods of time. It is well to administer sulfathiazole or sulfadiazine in moderate dosage for a period of twenty-four hours before and after instrumentation to avoid unnecessary reactions.

It is well known that a high per cent of cures can be obtained in the uncomplicated coliform infections through an adequate intake of either sulfathiazole or sulfadiazine. However, it has been established that this group of bacteria is resistant to penicillin. *Staphylococcus aureus* responded quite satisfactorily to sulfona-



mide therapy, but staphylococcus albus and many forms of streptococci, notably streptococcus fecalis, are not so sensitive to the various sulfonamides.

As regards the bacteria of the gram-positive group commonly seen in the urinary tract, staphylococcus aureus is, next to the gonococcus, most consistently sensitive to penicillin, as demonstrated both in the test tube and in the body. A severe and chronic infection of the bladder and stump of the ureter caused by staphylococcus aureus was cured with 100,000 units of penicillin administered in a dosage of 25,000 units at three-hour intervals. This cystitis had failed to respond to intermittent courses of the various sulfonamides and other urinary antiseptics administered during the previous eighteen months.

Various strains of staphylococci and other common gram-positive bacteria of the urinary tract appear to vary considerably in their sensitivity to penicillin. A simple method of testing these bacteria against penicillin in the test tube may prove of great value in predicting whether or not infections are likely to be cured by this drug. These tests are made by adding various concentrations of penicillin to a suitable agar medium and inoculating these mediums with pure strains of the various bacteria. Another method more comparable to that met by penicillin action as it penetrates these various infected areas in the body is to inoculate mediums containing penicillin with the infected exudates.

There is the same danger with the use of penicillin in chronic infections as was demonstrated with the sulfonamides, in that it may mask the signs and symptoms indicative of the need of surgical correction for many of the possible associated pathologic conditions of the urinary tract. The value of penicillin for one of the most chronic infections in the male, namely prostatitis, has not as yet been determined. Assuming a maximum office day of nine hours, it has been our experience that any method of

administration of a total dosage of 100,000 units will fail in most instances. The preliminary results, however, indicate that the administration of 300,000 to 400,000 units of penicillin\* administered during a nine-hour period will cure more of these infections than a five-to-seven-day course of sulfathiazole or sulfadiazine.

A MORE promising future method, however, is prolonging the action of penicillin by either one of two possible methods along the lines of which some investigative work has already been done. One method (Romansky and Rittman) prolongs the action through slower absorption of the drug as administered in a penicillin-beeswax-peanut oil mixture. The other method is that of an excretory blockade set up by the coincidental administration of other substances excreted mainly by the renal tubules, thus blocking and consequently prolonging the excretion period of the penicillin.

One group of investigators (Rammelkamp and Bradley) tested the effects of the simultaneous injection of penicillin and diodrast on clinical patients. In the control group there was 60 per cent excretion of penicillin by the end of one hour, which was reduced to 20 per cent as the result of the simultaneous injection of diodrast. Another group of investigators (Beyer and his associates) made use of para-amino-hippuric acid as the blocking agent, giving it simultaneously with the penicillin. With 78 per cent recovery of the injected penicillin in a given time in the controls, there was but 33 per cent recovery as a result of the para-amino-hippuric acid blockade. Obviously, this or some other nontoxic drug offers possibilities for practical application within the near future.

\*It now appears that oral penicillin will have to be administered in a dosage as high as 300,000 units every three hours for a period of two weeks or longer to assure a fair rate of cure in nonspecific prostatitis. (Herrold, Russell D.: Treatment of Chronic Nonspecific Prostatitis with Oral Penicillin. J. Urol. 57:897, May 1947.)

## DIAGNOSTIC CLINIC

# Trigeminal Neuralgia

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I WANT to show a typical case first and then discuss the subject in general.

This man is 54 years old. How long ago did you begin to have trouble?

PATIENT: About ten years ago.

OR. OLDBERG: Where was it when it began, in what part of the face?

PATIENT: In the lower jaw.

OR. OLDBERG: When it was in the lower jaw, what kind of pain was it? Was it a slow pain?

PATIENT: It was above the tooth.

OR. OLDBERG: About that time did it develop into shooting pains, jolting pains?

PATIENT: About a year later it began really to jolt.

OR. OLDBERG: And then as the years went by, what about its spread to other areas?

PATIENT: Well, after several years it began to shoot up into the eye and that was the most prominent of all, when it got to the eye.

OR. OLDBERG: How about into the tongue?

PATIENT: One night into the tongue, and that was bad, too.

OR. OLDBERG: The one feature that I am interested in hearing you talk about is whether this was a continuous pain that was there all the

time or whether it was a pain that just shot in there and jolted.

PATIENT: There were times when the pain was continuous and other times when it would flash like that—no warning at all.

OR. OLDBERG: What would bring it on, do you know?

PATIENT: Sometimes stepping out into the breeze or starting to talk in the morning, drinking water, or shaving, or any movement of the face; any little thing would bring it on.

OR. OLDBERG: What did you do about it all these years? You waited twelve years before you were operated on.

PATIENT: Just grin and bear it.

OR. OLDBERG: Did you have any teeth pulled or sinuses worked with or anything like that?

PATIENT: I had teeth pulled soon after the thing started.

DR. OLDBERG: Why? Because that might be it?

PATIENT: I thought it might be.

OR. OLDBERG: And so did the dentist?

PATIENT: Yes.

DR. OLDBERG: But it didn't help?

PATIENT: It didn't help at all.

DR. OLDBERG: Did you have anything else done?

PATIENT: No.

DR. OLDBERG: I think that is about all we want

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to ask you. You were operated upon sixteen days ago?

PATIENT: That is right.

DR. OLDBERG: And you went back to work?

PATIENT: Last Friday.

DR. OLDBERG: Inside and outside, on a surveyor's chain and working on books Friday. That is ten days after the operation.

PATIENT: That is right.

This man, of course, suffers from trigeminal neuralgia. This symptom-complex is one of the most characteristic, and therefore usually one of the most easily diagnosed, of all disease syndromes. Because of its not infrequent confusion with other quasi-similar conditions, and because of the utter inadequacy and downright incorrectness of treatment that may be engendered by a mistaken diagnosis, an occasional clinic on the subject for the general profession, is in order.

The first writings on this subject were those of Fothergill, in England in 1773, whose description was so graphic that for many years the condition was called Fothergill's disease. When later anatomic knowledge fixed the responsibility on the fifth cranial nerve, it came to be called trigeminal neuralgia. Other synonyms are "trifacial neuralgia" and "tic douloureux."

The etiology and pathology of trigeminal neuralgia are not definitely known, but since it is a disease of middle and latter life, and since a fair proportion of patients seen with it are hypertensive, the condition of the vascular tree may have some influence. Some observers have declared that in a large proportion of cases the etiology is due to tumors or to impingement of a pulsating sclerotic vessel against the sensory root of the nerve, but upon this matter there is no general agreement. It is certain that serial sections of the gasserian ganglion and its ramifications show no variation between the normal and the "tic" sufferer. And the latter is as likely to live to a ripe old age as any other man.

**B**EFORE considering the disease and its symptoms and cure, a knowledge of the fundamental anatomy of the nerve is essential. Al-



ERIC OLDBERG

though it is large and has many branches, the trigeminal nerve is actually the simplest of the twelve cranial nerves. The others are all specialized, and may be purely motor or sensory, or may be designed to receive special stimuli like light or sound or taste, or may carry parasympathetic fibers, etc. The fifth nerve, however, is the simple cranial counterpart of an ordinary spinal nerve.

The spinal nerves make up the innervation to the trunk and extremities, and combinations of them are the components of all peripheral nerves, such as the radial, median, ulnar, sciatic, intercostals, and so on. These nerves are mixed, and are made up of motor and sensory fibers. The motor fibers take origin in the anterior horn cells of the gray matter of the spinal cord, whose axons leave each segment of the cord in a bundle, called the motor or anterior root. The sensory fibers take origin outside the central nervous system—but are contiguous to it—in the posterior root ganglion

for each segment. The cells in the ganglion have single processes which split like a T, one branch of which joins the ganglion to the posterior portion of the spinal cord, while the other branch runs peripherally, to join the anterior or motor root axons, thereby forming an ordinary mixed, or sensorimotor nerve.

In just this same way, the trigeminal nerve is the ordinary mixed nerve to the head and face. The motor portion, or root, takes origin in the gray matter of the pons in cells similar to those in the cord, and runs peripherally to innervate the muscles of mastication—the masseter, the temporal, and the pterygoids. The sensory portion arises on the floor of the cranial cavity in the middle fossa at the base of the brain, in the gasserian ganglion, sometimes called semilunar or trifacial or trigeminal ganglion. The gasserian ganglion cells are exactly like those of the spinal root ganglia, in that they have T-shaped processes which divide, one branch going peripherally, and the other joining the ganglion to the pons.

It is only here that a little anatomic elaboration is necessary. The sensory portion of the fifth nerve has a tremendous territory to serve; this accounts for its large size. Being the only cranial nerve in common service, it must cover the entire area from the vertex of the scalp to the under surface of the chin. Even the dural vessels are innervated by this nerve, as well as the sinuses, the conjunctiva, the mucous membrane of the nose and mouth, the teeth and gums of both jaws, and the anterior two-thirds of the tongue. Therefore, to economize in size, the peripheral sensory branch, coming from the ganglion, leaves the skull in three bundles rather than one, to reach the soft tissues in which its terminations lie.

These three bundles, or divisions, roughly divide the head and face into three parts. The first, or ophthalmic division, leaves the skull through the superior orbital fissure, together with the third, fourth, and sixth nerves, to supply sensation to the scalp, forehead, and eye. A familiar branch of this division is the supra-orbital nerve. The second, or maxillary, division makes its exit through the foramen rotundum

and supplies the maxillary portion of the face, including the nose, inside and out, upper jaw, and roof of the mouth. A familiar branch of this is the infra-orbital nerve. The third, or mandibular division, leaves the cranial cavity by way of the foramen ovale, en route to the chin, lower jaw, floor of the mouth, and anterior two-thirds of the tongue. A familiar branch of it is the mental nerve. Since the third division innervates the lower, or movable and chewing jaw, it is natural that it should be the division joined by the motor root previously mentioned, which innervates the muscles which move this jaw. Therefore, the ophthalmic and maxillary divisions are purely sensory, whereas the mandibular division is mixed, being both motor and sensory.

THIS anatomic preamble was necessary because a knowledge of it is essential to a proper conception of the disease and its treatment. A consideration of the symptoms is next in order, preceded by a few details. Trigeminal neuralgia, as previously stated, is a disease of latter life. It is almost unheard of before twenty, very rare before thirty, uncommon before forty, fairly common before fifty, and it reaches the peak of incidence in the ensuing decade. Every neurologic surgeon of experience has seen and has probably operated upon patients in the eighties and even over ninety. It is one and a half times as prevalent in women as in men and occurs on the right side of the face in the same ratio. It may be bilateral on rather rare occasions—although Harris in England reported as high as 4 per cent—but the involvement of the second side usually succeeds the original affliction after an interval of years. The most frequent site of origin, in my experience, is about evenly divided between the distribution of the third division and the infra-orbital branch of the second. The rarest site of origin is the distribution of the first division and its supra-orbital branch (less than 5 per cent). As the disease progresses and the years go by, the area involved may spread to contiguous

divisions. The pain does not extend across the midline of the face.

To make a diagnosis of this condition, the presence of one feature is imperative and absolutely essential. That is the paroxysmal nature of the attacks. Without it, one cannot make a diagnosis, and with it, the symptom proves virtually pathognomonic. Attacks of trigeminal neuralgia strike just like lightning. At times they may occur spontaneously, and at other times patients may observe that they are brought on by touching certain areas (trigger zones), by chewing, talking, drinking cold water, being exposed to cold drafts, etc.

The characteristic patient enters the office slowly and with caution, holds his face immobile while he talks, is unwashed and unshaven on the affected side, shrinks when anyone approaches his face, and, sad-to-say, is frequently toothless because some unsophisticated dental colleague has made an unavailing effort to relieve him. If the patient is old or presenile, or is sick of describing the details of his trouble, it may be difficult to extract a good description from him; but the examiner must persevere, for the attacks *must be paroxysmal*. Their duration may be momentary, or up to a minute or two, but the diagnosis cannot be made without a history showing that each time they strike, they do so with instantaneous ferocity, then disappear, and strike again. Continuous aching pains, which come on gradually, reach a height over minutes or hours, and then slowly subside, are not indicative of trigeminal neuralgia, and to treat them as such leads only to trouble.

Trigeminal neuralgia usually runs a remitting course in the early years. The patient may have a few attacks over several days or weeks, and then a remission of a year or more. It is this which makes him reluctant to see the surgeon, and persuades him to try nasal, dental, and sinus subterfuges for a time—for he hopes that with his next remission will come permanent peace. This is never realized, however, for recurrence is as sure as is survival. With each recurrence, the attacks are usually more frequent and severe, the territory involved greater, and the bouts longer. Finally, after three to

five years or more the patient gives up and comes for treatment.

Medical treatment of trigeminal neuralgia is not successful. This has its happy aspects, for the pain is so severe that reasonable use of narcotics will not touch it, and therefore one never sees an addict. Tinkering with the sinuses or teeth is of no avail, though it is often done. Vitamin B<sub>1</sub> and ferrous carbonate have been tried, but have met with indifferent success. One can sometimes give moderate relief from individual attacks with the inhalant trichloroethylene, a first cousin to chloroform.

The only thing which completely cures, temporarily or permanently, is to attack the nerve. There are three methods of doing this—by injecting alcohol into its branches, by cutting its sensory root, or by dividing its pathway in the brain stem.

ALCOHOL injection gives not only temporary relief but also complete relief if the responsible branch or division of the nerve can be successfully attacked. The most common places for injection are the supra-orbital branch of the first division at the supra-orbital foramen, the infra-orbital branch of the second division at the infra-orbital foramen, the second division itself at the foramen rotundum, or the third division at the foramen ovale. The latter injection also causes a temporary motor paralysis, since the motor fibers going to the muscles of mastication are mixed with the third division at this point. The first division cannot be injected in its entirety at the superior orbital fissure, since alcohol in this location produces an ophthalmoplegia by affecting the third, fourth, and sixth nerves, which exist through the same opening.

Alcohol injections must be done at a point where the division or branch is fixed, since, in order to be effective, the point of the needle must pierce the nerve sheath so that alcohol may mix directly with the fibers and kill them by precipitation of their protein. Alcohol will not infiltrate tissue as do watery solutions. Skillful alcohol injection entirely replaces

peripheral neurectomies, such as were performed some years ago. Neither procedure, however, is permanent since the eventual and inevitable regeneration of fibers down to their terminations is accompanied by a recurrence of the disease. Nevertheless, alcohol injection remains a useful and frequently practiced procedure for many patients—especially those who have had long remissions and still hope that another and final one will occur, and, therefore, are not psychologically prepared for the permanent abolition of all facial common sensation by operation. Alcohol injection may be repeated once or twice, but its efficacy then wears out, because of compartmentation of the nerve with scar tissue, and resultant inaccessibility of some fibers. The usual period of relief from a successful alcohol injection is one to two years.

Operations therefore are the only permanent cure. The standard operation performed almost everywhere by neurologic surgeons involves an approach to the gasserian ganglion through very much the same route one uses in doing a decompression. An incision is made in front of the ear so that the hair will conceal it, and a small opening is made in the temporal bone. The dura is then peeled up from the floor of the middle fossa and the middle meningeal artery divided. The ganglion is then exposed and the posterior root which joins it to the pons is divided. Refinements which have been added to this procedure have been (1) the sparing of the motor root, which lies separately from the sensory root, and (2) only partial section of the sensory root in patients with second or third division tic, in order to preserve sensation to the eye and thereby protect it. This latter refinement is called a differential section.

However, it allows for about a 10 per cent chance of recurrence carried by the intact fibers, for which complete section may eventually be necessary. When the sensory root is divided between the ganglion and the pons, there can be no question of regeneration, since the essential neurilemma sheath is lacking from the fibers here.

AN OPERATING technic has also been devised for special cases. In this operation the tract for pain serving this nerve is sectioned in its course through the medulla. This operation is particularly useful in facial malignancies, for the upper cervical nerves, which run into the parotid area, may be sectioned at the same time. Finally, I should add that some surgeons prefer to approach the sensory root from behind in the posterior fossa rather than the usual approach from the side through the middle fossa. All these procedures carry a mortality rate which should be negligible, and I frequently tell my patients that the operation is harder on the surgeon than it is on the patient.

Total hospitalization is usually a week or less, and the total disability for return to work, including the time spent in the hospital, is usually less than a month.

In conclusion, it may be stated that the important thing in trigeminal neuralgia, a not uncommon disease, is to diagnose it properly. Once this is done, the treatment, though specialized, is stereotyped. Early and proper diagnosis, however, may save the patient much time, much agony, much money, many futile medical and dental procedures, and possibly his respect for the medical profession.

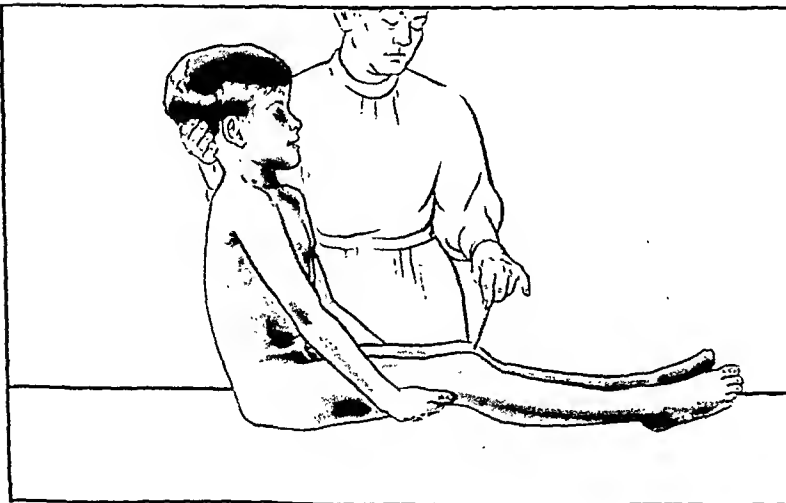
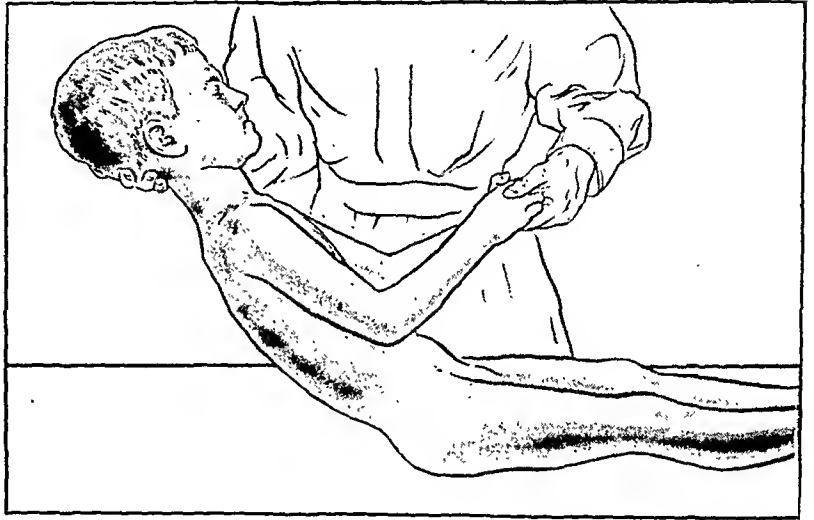
# SOME DIAGNOSTIC AIDS IN ACUTE ANTERIOR POLIOMYELITIS

*A presentation of the National Foundation for Infantile Paralysis  
in the Scientific Exhibits Section of the Centennial Convention of  
the American Medical Association, Atlantic City, June 1947.*

## BACK RIGIDITY IN POLIOMYELITIS

### *Poliomyelitis.*

The patient is aided in his attempt to sit up by supporting the occiput and arms. The head and back move as one nearly inflexible structure. The neck and back may be "rubbery" rather than completely inflexible. Note the expression of distress.



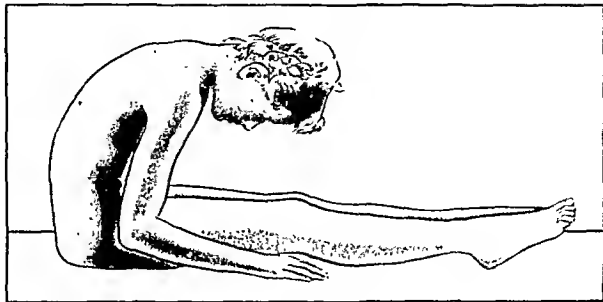
### *Poliomyelitis.*

A continuation of the procedure shown in figure above. As soon as patient is upright, the knees become somewhat flexed. The patient's hands reach for the knees either because of pain or to help support himself in an upright position. The chin cannot be brought to the chest nor the head to the level of the knees.

## FLEXIBILITY OF BACK IN THE NORMAL CHILD

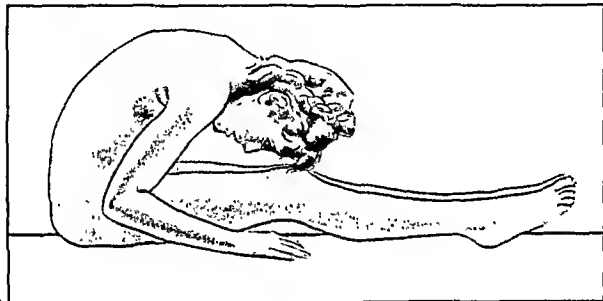
*Normal.*

An average comfortable position with curving of back and neck. The knees are slightly flexed.



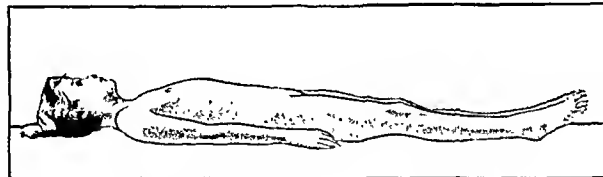
*Normal.*

More extreme flexibility with the forehead touching the knees. Knees are slightly flexed.



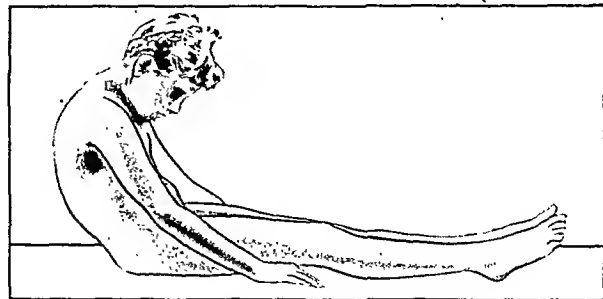
*Normal.*

Supine and relaxed.



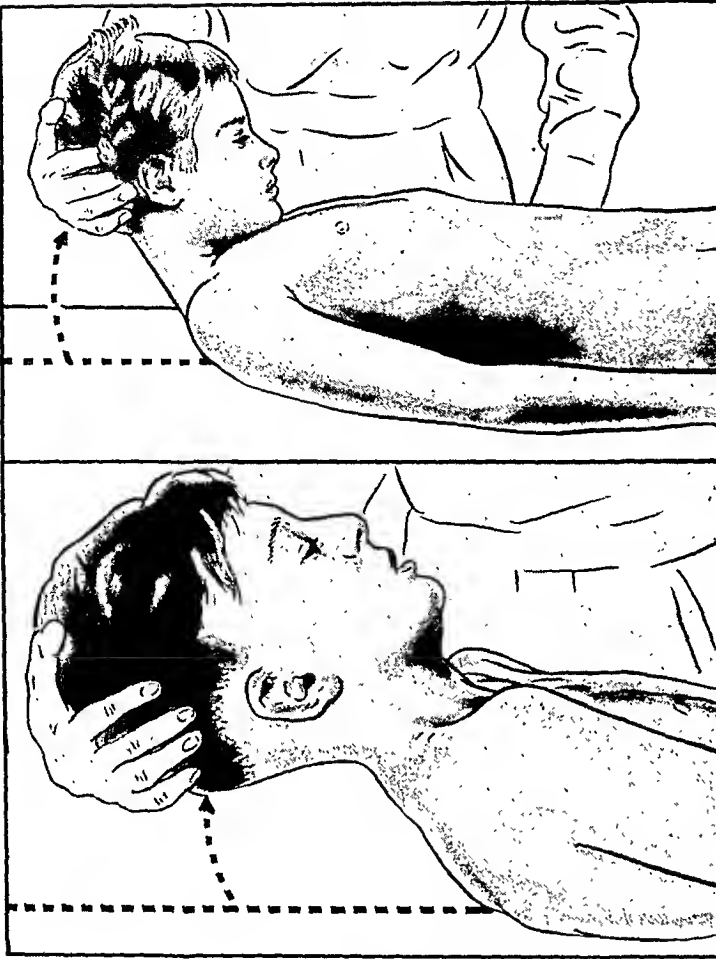
*Normal.*

Supine and relaxed.





## NECK RIGIDITY IN POLIOMYELITIS



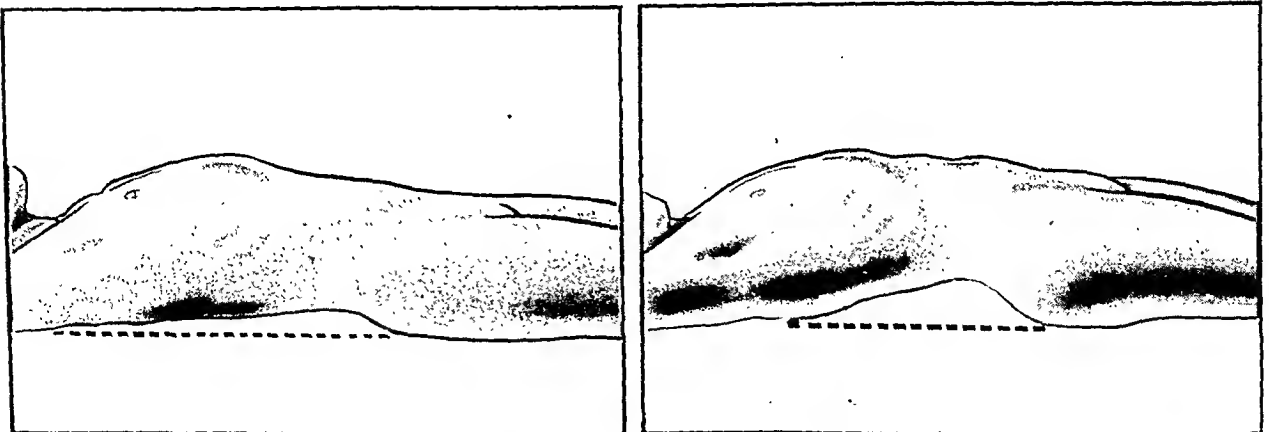
### *Normal.*

The chin touches the chest either voluntarily or with support.

### *Poliomyelitis.*

The head is held rigidly upon the shoulders, with slight posterior retraction. When the head is lifted by flexion, the head, neck and shoulders move as one unit. The accessory flexors, such as the platysma, are used. Pectoral rigidity below the clavicles, causing "cupping" of the shoulders, is frequently observable in the child.

## BACK RIGIDITY IN POLIOMYELITIS



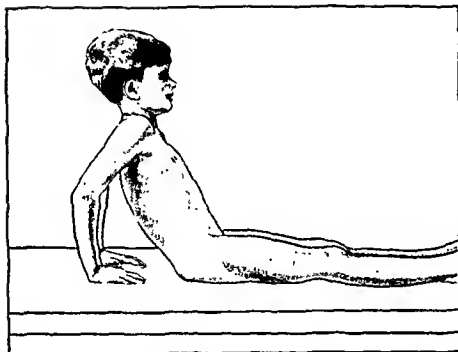
### *Normal.*

The child lies supine, with hips and upper back touching the table, with the arms raised above the head.

### *Poliomyelitis.*

The lumbar lordosis is sufficiently marked so that the hand and arm of the examiner may be passed under the patient through the arch formed by the muscles of the back.

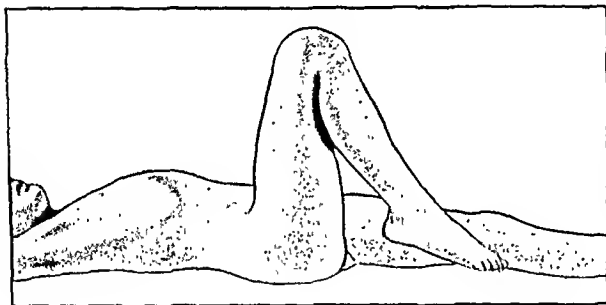
## THE "TRIPOD" SIGN



### *Poliomyelitis.*

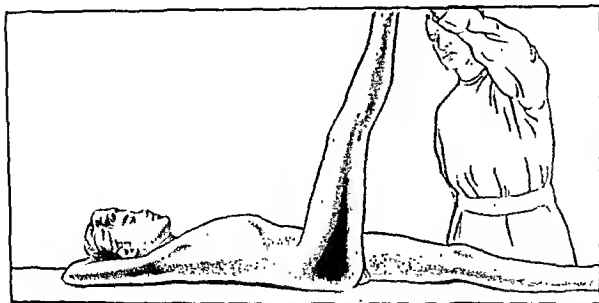
When the patient attempts to sit up, without aid from the examiner, he is forced to use his arms for support in the position of a tripod. Almost all flexion takes place at the hips, sometimes unequal in degree on the two sides. The patient, as illustrated, shows some distress but less than when a similar maneuver is carried out by the examiner. Contrast with the normal action shown on page 117.

## FLEXION OF THE HIP AND EXTENSION OF THE KNEE IN THE NORMAL CHILD



### *Normal.*

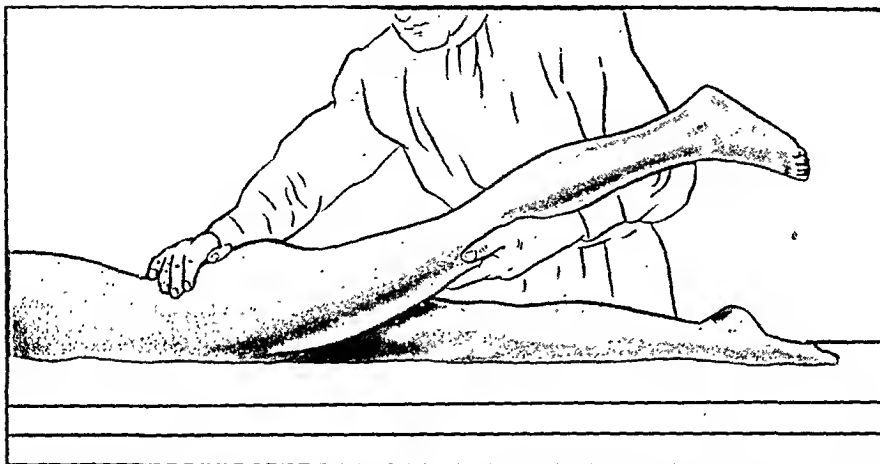
The hip is partially flexed with the knee completely flexed as a voluntary movement.



### *Normal.*

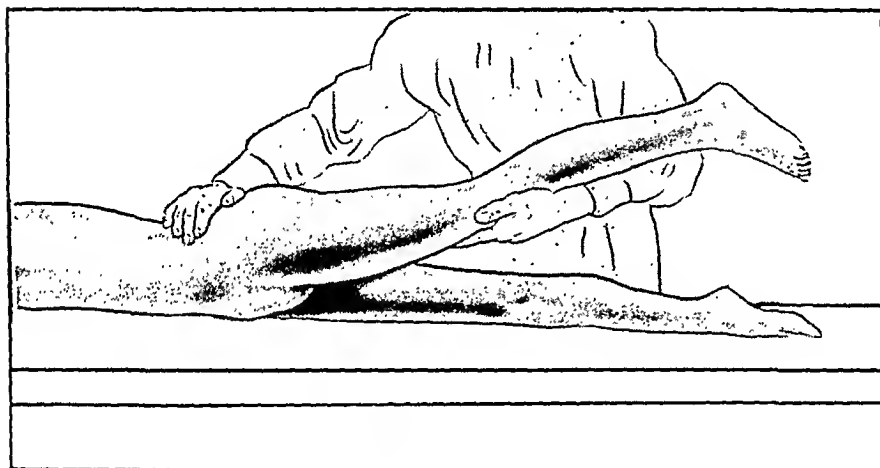
Full extension of the knee is accomplished in this position with the aid of the examiner.

## RIGIDITY OF HIP FLEXOR IN POLIOMYELITIS



*Normal.*

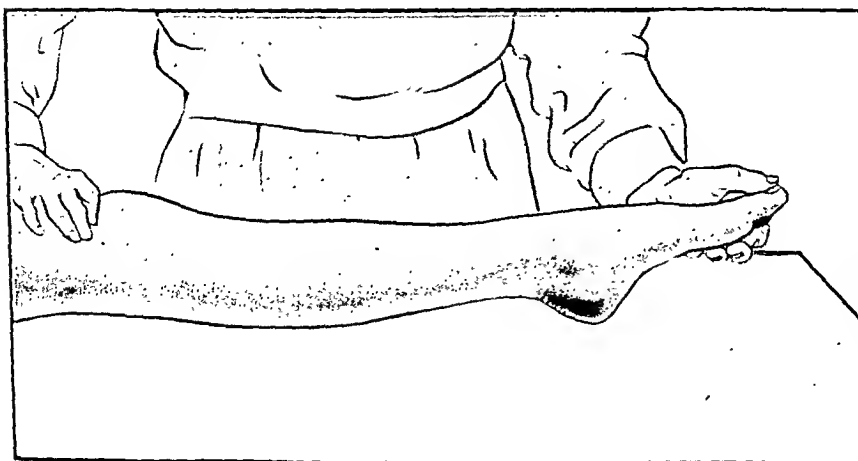
The extremity is extended at the hip with the patient prone.



*Poliomyelitis.*

Extension is restricted and the pelvis is raised and rotated towards the examiner.

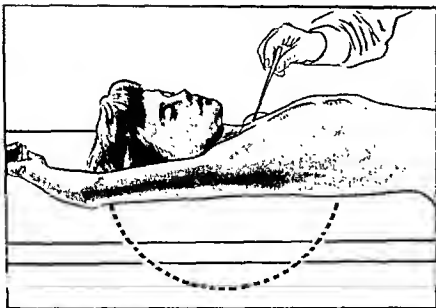
## RIGIDITY OF ANTERIOR TIBIAL IN POLIOMYELITIS



*Normal.*

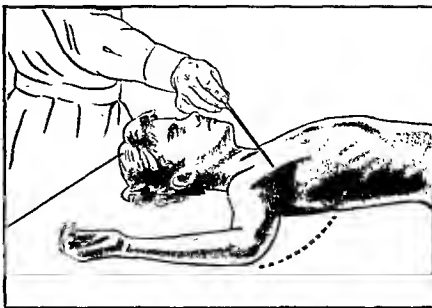
The foot is fully plantar extended by the examiner.

## SHOULDER RIGIDITY IN POLIOMYELITIS



### *Normal.*

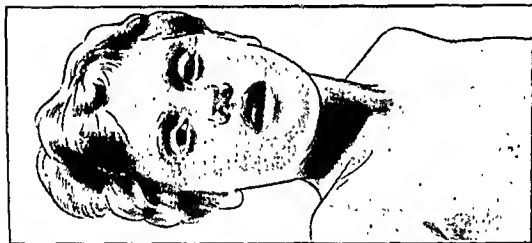
Full abduction of the arm, without restriction by the pectoral muscles.



### *Poliomyelitis.*

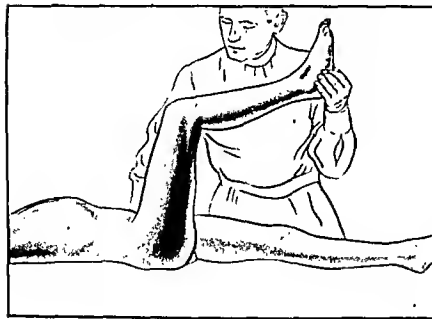
Rigidity of the pectoral muscle holds shoulder in partial flexion and prevents full abduction and elevation.

## FACIAL EXPRESSION IN POLIOMYELITIS



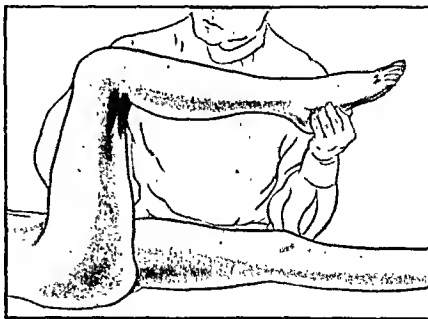
Patients often show anxiety, tenseness and distress in facial expression. The mouth may be open if breathing is restricted, and the face is mask-like but anxious. The sterno-mastoid muscle may be very prominent.

## THE KERNIG SIGN IN POLIOMYELITIS



### *Poliomyelitis.*

Shortening and rigidity of the flexors of the knee in Kernig position.



### *Poliomyelitis.*

More extreme shortening of the flexors not usually seen to this degree in poliomyelitis and more suggestive of meningitis.

# EDITORIALS

## PRESENT STATUS OF FOLIC ACID THERAPY

THE finding of a single synthetic chemical compound of known molecular structure which is effective in treating persons with pernicious anemia, nutritional macrocytic anemia, and tropical sprue, is a medical event of great importance. This substance, pteroylglutamic acid, commonly called folic acid, is the newest member of the vitamin B-complex.

The name "folic acid" originally was given to a substance obtained in nearly pure form from spinach by Mitchell, Snell and Williams. This substance supports growth for two organisms, frequently used in microbiologic investigations: *Lactobacillus casei* and *Streptococcus lactis* R (now termed *Streptococcus faecalis*). It was isolated independently from liver by Stokstad and by Pfiffner and his associates and an identical substance was synthesized by Angier and his co-workers.

Folic acid occurs in nature in a free form and also as a part of various complexes. The following five substances have been isolated in crystalline form: (1) vitamin Bc, (2) *Lactobacillus casei* factor from liver, (3) L. *casei* factor from yeast, (4) another L. *casei* factor isolated from a fermentation residue, and (5) vitamin Bc conjugate. Vitamin Bc, the L. *casei* factor from liver, and the L. *casei* factor from yeast are identical with the synthetic product described by Angier and his associates. This compound, folic acid or pteroylglutamic acid, contains one molecule of glutamic acid. In con-

trast, the special L. *casei* factor isolated from the fermentation residue yields three molecules of glutamic acid. The vitamin Bc conjugate isolated by Pfiffner and his co-workers yields seven molecules of glutamic acid.

While folic acid has been accepted as a potent hemopoietic agent, clinical studies with the fermentation factor and vitamin Bc conjugate have not been extensive. Published reports on these substances, however, indicate that they too are somewhat effective in producing a hematologic response in certain types of macrocytic anemia in relapse.

The gradual increase in our knowledge of hemopoiesis and the development of effective anti-anemic therapy are intensely interesting subjects. In the mythology of many races, the idea of taking liver internally goes back to antiquity. The era of its modern usefulness in man was initiated in 1926 by Minot and Murphy when they showed that the oral administration of large doses of whole liver effected a remission of Addisonian pernicious anemia in relapse. Soon, liver was tested in various cases of macrocytic anemia and was found to be an effective hematopoietic substance in the treatment of the macrocytic anemia of pregnancy, tropical sprue, non-tropical sprue, nutritional macrocytic anemia, and pernicious anemia.

It soon became apparent that a potent extract from liver would be less difficult to administer than whole liver, and a number of crude liver extracts were prepared. Within two years Cohn had developed his fraction G which became widely used in treating macrocytic anemias due to the absence or deficiency of the erythrocyte maturation factor. Eventually, more concen-

trated liver extracts were prepared and became the standard of those students who were assaying new substances and new liver fractions.

The concept arose that liver might contain many substances which might be hematologically active, a concept that was strengthened by the observation that some substance or substances were destroyed or discarded in the concentration of crude liver extract as determined by the hematopoietic response effected by both crude and concentrated liver extract.

Realizing that liver extract was a mixture of many chemical substances, investigators knew that they were facing a long and tedious task in attempting to isolate the active principle or principles. Many fractions of liver extract, many nutrients, concentrates, and synthetic substances were tested for their hematopoietic properties. Some of them had slight activity, but most of them had none. Folic acid was known to be present in infinitesimal amounts in a number of potent liver extracts but, working on the hypothesis that a number of chemical molecules could effect hemopoiesis and that folic acid might well be one of them, investigators tested it in macrocytic anemia in relapse, and its efficacy was quickly demonstrated.

Thus, for the first time, it was possible to administer a pure synthetic compound to persons with the macrocytic anemia of pernicious anemia, of nutritional deficiency of pregnancy, and of tropical or non-tropical sprue, so as to effect a hematologic remission. This discovery has at long last placed investigations in the field of the macrocytic anemias in the realm of pure compound therapy, and is a step toward learning more of the etiology and pathogenesis of these anemias.

A review of the biological and clinical aspects of studies with folic acid has been published by Berry and Spies and by Spies. Soon after folic acid therapy is initiated, the numbers of megaloblasts and early erythroblasts in the bone marrow decrease progressively and the late erythroblasts and normoblasts increase. Eventually, the normal ratio of nucleated red blood cells and white blood cells of the marrow is reestablished. As early as the second day of treatment, reticulocytosis can be detected in the bone marrow, and frequently it can be detected in the peripheral blood from the third to the fifth day of therapy. A peak usually is reached on the sixth to the tenth day, the height of the rise varying from case to case, depending upon the severity of the anemia, the

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adequacy of the dose, and the presence or absence of complications. This is followed by a gradual increase in the number of red blood cells and in the hemoglobin. When thrombocytopenia or leukopenia is present, as is frequently the case, increases toward normal usually occur.

The clinical improvement which parallels the hematologic response is equally dramatic. When the reticulocytes begin to rise, the patients experience a remarkable improvement in the feeling of well-being. There is a sudden and tremendous increase in their appetites which is accompanied by a return of strength and vigor and usually by a gain in weight. The chief limitation of folic acid is that it will neither prevent the development of acute or subacute combined degeneration which frequently occurs in Addisonian pernicious anemia, nor will it relieve it once it has developed. Liver extract, along with folic acid, should be given in a dosage sufficient to relieve signs of acute or subacute degeneration. In patients who are allergic to liver extract, folic acid is a valuable substitute unless the patient has neural degeneration. In such cases folic acid therapy should be supplemented with the necessary amount of liver extract.

As yet, no satisfactory explanation has been given for the fact that relatively large amounts of folic acid are required to produce a satisfactory hemopoietic response. Despite the many intensive clinical studies which have been made on folic acid as a therapeutic agent, the final word on dosage cannot be stated definitely. In most cases, from 10 to 20 mg. daily, in divided doses given either orally or by injection, is sufficient to induce a remission in persons with nutritional macrocytic anemia, the macrocytic anemia of tropical or non-tropical sprue, or Addisonian pernicious anemia in relapse. No unpleasant side effects have been observed.

Because of the world-wide distribution of macrocytic anemias, physicians everywhere have contemplated the best method for their detection and therapy. The active principle in liver extract probably is not folic acid but a very powerful substance which when obtained

in pure form probably will be more efficacious per unit weight than is folic acid.

The final place of folic acid in the treatment of pernicious anemia, nutritional macrocytic anemia and sprue has not been determined. Nevertheless, the use of folic acid is opening a fresh and fertile field, and the macrocytic anemias will have to be redefined in the light of the new evidence in regard to their pathogenesis.

TOM D. SPIES, M.D.

## VITREOUS TRANSPLANTATION

MUCH has been in the news of late regard the Eye Bank for Sight Restoration, a worthy organization designed to promote the restoration of sight among persons suffering from corneal defects. Officials of the Eye Bank have calculated that corneal transplantations will benefit from ten thousand to twenty-five thousand blind persons in this country alone.

Less well known are the pioneer endeavors to transplant the human vitreous. Generally, ophthalmologists leave the vitreous alone. Hence, although some experimental work was done as long ago as 1890, not until last year did a paper appear in which human vitreous transplantation was reported. Recently, Cutler, the originator of the technic, has released his second report in which he discusses the results of his first 13 cases of vitreous transplantation.

The technic involves the withdrawal of 1.5 cc. of vitreous from the eye of the patient, with an 18-gauge needle on a 5 cc. syringe. The syringe is then detached, and another is attached to the needle. This syringe contains 2 cc. of clear vitreous from a recently enucleated eye; it is injected until the patient's eye has reformed.

Eight of Cutler's patients had vitreous transplantation for vitreous hemorrhage. Four of the operations were successful. Improvement in vision ranged from light perception to 20/50, and from 20/300 to 20/25. A fifth operation was partially successful, and the remaining three were failures, probably due to retinal de-

tachments. Five other patients were operated, all because of detachment of the retina. Only one of these is considered to have been benefited. All of these patients were considered difficult, however, and they had all had retinal detachment operations previously.

Obviously, the technic will be revised many times in coming years. There can be little doubt, however, that Cutler has made a real contribution in demonstrating conclusively that clear vitreous can be used to transplant abnormal vitreous.

### THE RICKETTSIAL DISEASES

DISEASES caused by rickettsia have received increased recognition in recent years. Typhus, of both the epidemic and murine varieties, is by no means a closed problem. Rocky Mountain spotted fever is no longer confined to the area which gave it its name but has been found east of the Alleghenies. Tsutsugamushi disease, or scrub typhus, boutonneuse fever, Kenya typhus and South African tick bite fever do not as yet appear to have become problems in this country. A new skin disease, so far mild in character and restricted in distribution, has been traced to mice and their parasites. This has been called Rickettsialpox (Huebner, Robert J., et al., Public Health Reports, May 30, 1947).

There are four types of vectors for the rickettsial diseases. The world-wide distribution of these vectors clearly indicates that the rickettsial diseases can become an even more serious problem than they have been to date.

According to Kohls (Vectors of Rickettsial Diseases, Ann. Int. Med. 26:713, May 1947), the four groups of parasites which will transmit rickettsial diseases to man are ticks, mites, lice and fleas. Ticks are responsible for transmission of the spotted fever and boutonneuse fever types and are probably involved in the disease known as Q fever which appears to be indigenous to Australia and has not been found to occur naturally in this country as yet. Mites have so far been shown to be vectors of only

one of the rickettsial diseases, namely, tsutsugamushi disease. The European, or epidemic type of typhus, is transmitted by lice and the murine, or endemic typhus, by fleas.

In view of the known distribution of the rickettsial diseases today and the difficulty in eradicating the numerous potential vectors, it seems likely that diseases of this type will become more serious before becoming less so. It is peculiarly fortunate, therefore, that what appears to be an excellent treatment for at least some of the rickettsial diseases in the form of P.A.B.A. (para-aminobenzoic acid) is now available. Even with this treatment, however, every effort must be made to prevent the spread of those which are indigenous and to impede the entry of those which have not yet been discovered in the United States.

### PEPTIC ULCER

R EPORTS are continuing to appear regarding the use of protein hydrolysates in the treatment of peptic ulcer. A late issue of *Gastroenterology* carried two papers which are worthy of comment. Hodges treated for two to three weeks 26 patients suffering with chronic peptic ulcer. He used a protein hydrolysate-carbohydrate mixture. While the treatment produced better results than those obtained with a conventional dietary regime, the frequency of relapses was not diminished. Three patients failed to respond. In general, the patients gained weight, and gastric acidity was reduced.

Kimble reported results with a series of 15 patients, of which 13 had duodenal ulcer, 1 a combined duodenal and gastric ulcer, and 1 a gastric ulcer alone. The patients were treated for an average of nine days, during which 1,500 cc. of a 6 per cent solution of protein hydrolysate were administered daily by gastric drip or venoclysis. Following treatment, x-ray evidence revealed that the ulcers had disappeared in 9 of the patients. Another 5 showed marked improvement; one patient did not respond. Serum proteins were elevated, and most of the patients gained weight.



# This Month in Medicine

## POLIOMYELITIS

SINCE the poliomyelitis season is at hand, Sabin has presented some guiding principles designed to restrain the spread of poliomyelitis virus.

Most often, the virus appears to be spread through contamination with feces, since it lives for some time in the intestinal contents and stools of both the apparently healthy as well as acutely paralyzed persons. From these sources, contamination of hands and fomites allows the virus to be disseminated; or "filth" flies may deposit it in infective amounts on food. Sabin does not believe that available evidence supports the view that droplets from the respiratory tract play a significant role in the spread of the poliomyelitis virus.

With these epidemiologic facts in mind, Sabin offers a few pointers that are well worth remembering. Closing of movies and churches is unwarranted, but playgrounds and swimming pools should be closed during an epidemic. If schools can observe rigid health discipline, they may remain open, since apparently the virus is not spread by the mere presence of large numbers, but rather by playing, shaking hands, and using a common toilet without adequate hand-washing facilities.

All home measures that prevent contamination of food by flies are good. However, mass destruction of flies by DDT—spraying a whole city from an airplane, while dramatic and newsworthy, is of little epidemiologic value. Flies should not be allowed to breed on sewage sludge beds, nor should they have access to raw sewage.

Stools from patients with poliomyelitis may be disposed of directly into the sewage system, without sterilization; for the sewage is already contaminated by virus in the feces of persons who are not known to be infected. On general hospital wards patients should be treated with the "typhoid technic" for four weeks following the appearance of symptoms. Laundry of patients is

contaminated; laundry workers, therefore, should be advised regarding the use of gloves and washing of hands.

Patients should be isolated, in the home, for from two to four weeks following the onset of symptoms. Members of the patient's family, if public food handlers, should not return to work for at least two weeks, nor should they come in contact with children.

Sabin points out that while these measures will not stop an epidemic, they should reduce the number of persons that will become infected.

### SUGGESTED READING

Sabin, A. B.: *The Epidemiology of poliomyelitis*, J. A. M. A. 134:749, June 28, 1947.

## SERODIAGNOSIS OF CANCER

STADIE and his associates have been unable to confirm the recent results of Duboff and Hirshfeld who, using a tyrosinase color test, reported that the serum of 89 per cent of 140 cases of proven active malignant neoplastic disease showed an inhibition of color development equal to or greater than 15 per cent when compared to controls without serum. Only 3 in 117 normal subjects, and only 9 of 68 patients with clinical conditions other than cancer gave color inhibition greater than 15 per cent.

On the basis of these findings, Duboff and Hirshfeld developed an interesting serodiagnostic test for cancer. If it could be confirmed, it would be quite important. Regrettably, Stadie and his associates, using what appears to be the same technic, could not distinguish the sera of 37 cancerous and 42 non-cancerous subjects.

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Stadie, W. C.: *The tyrosinase inhibiting action of serum from normal and cancerous patients*. Am. J. M. Sc. 213:655, June 1947.

## ASTHMA AND INTRAVENOUS ETHYL ALCOHOL

ASTHMATIC patients who have been wheezing for hours on end become "hungry, thirsty, tense, and tired." To give them surcease from these various physical woes, as well as to treat their asthma, several types of medication are necessary, the actions of which are not always consistent. Obviously, a single, intravenous drug would be desirable. But such a drug, to be ideal, should be non-toxic, non-allergenic, and evenly and rapidly metabolized. It should have a wide margin of safety between the pharmacologic and toxic doses. It should be a sedative, a vasodilator, and a respiratory stimulant.

Brown, in the May-June issue of the *Annals of Allergy*, suggests that ethyl alcohol, administered intravenously, fulfills these criteria. On the basis of the experience of Behan in this country, and Verkhovskaya in Russia, both of whom used intravenous ethyl alcohol as an analgesic and anesthetic, Brown administered this drug to patients with severe bronchial asthma. A 5 per cent ethyl alcohol solution in physiologic 5 per cent glucose-saline solution, with or without epinephrine 1:1,000, was given intravenously at the rate of 80-100 drops per minute. This effectively relieved severe bronchial asthma in 5 of 6 patients who had not responded to the usual medications.

The treatment was used on 26 additional patients, with similar results. There were no complications or side effects. Brown mentions that Dr. J. D. Gillaspie of Boulder, Colorado, independently discovered the same treatment, and successfully used it on 5 patients with severe bronchial asthma.

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Behan, R. J.: Ethyl alcohol intravenously as postoperative sedation. *Am. J. Surg.* 69:227, August 1945.

Verkhovskaya, E. V.: Intravenous alcohol anesthesia. *Am. Rev. Soviet Med.* 21:260, February 1945.

Editorial: Intravenous alcohol anesthesia as used in Russia. *J. A. M. A.* 128:133, May 12, 1945.

Brown, E. A.: The use of intravenous ethyl alcohol in the treatment of status asthmaticus. *Annals of Allergy* 5:193, May-June 1947.

## CHOLECYSTECTOMY AND TYPHOID CARRIERS

IN 1913, Leary, an Army doctor, reported one of the earliest attempts to clear up the typhoid carrier state, by cholecystectomy. His two patients were young soldiers, one of whom had a chronic hiliary fistula which discharged a clear mucoid material. Cultures of this discharge revealed that it was a pure colony of typhoid bacilli. Stools also were positive for the same organism. At operation, a stone was found impacted in the cystic duct. The gallbladder and cystic duct were removed; the stools were negative, and recovery was uneventful.

Leary's second case, at operation, was found to have a distended gallbladder full of stones. The gallbladder contents cultured out pure typhoid bacilli. After cholecystectomy, recovery was complete, stools became negative.

In spite of this report, cholecystectomy was for some years regarded with considerable disfavor, in correcting the typhoid carrier state. Lately, however, it has come to be accepted as a valuable treatment. Stout and his associates recently have reported a case, similar to those mentioned above, in which the typhoid carrier state was eradicated when the gallbladder, containing typhoid bacilli and small stones, was removed. Results were not entirely unequivocal, however, for penicillin and sulfathiazole were also used. However, these drugs cannot be assumed to take the place of surgery, in the treatment of chronic foci of infection.

Five years ago, Saphir and his associates suggested that before cholecystectomy be resorted to, particularly in carriers past 50 years of age and in the presence of a well functioning gallbladder, soluble iodophthalein should be considered. Of 65 bile carriers treated with iodophthalein, the bile was sterilized in 32.3 per cent and the stool was freed of typhoid bacilli in 7.6 per cent.

### SUGGESTED READING

Stout, S. L., et al.: Typhoid carrier state-treatment by cholecystectomy. *Jour. Kansas M. Soc.* 48:273, June 1947.

Saphir, W., et al.: The typhoid carrier problem. *J. A. M. A.* 118:964, March 21, 1942.

Beckman, H.: Treatment in general practice. Philadelphia, W. B. Saunders, p. 338, 1946.

R. W. C.

# Consultation Service

This special consultation information service is offered as a regular monthly feature of *Postgraduate Medicine*. Readers are invited to call on this Service for answers to difficult medical problems from members of our Editorial Board best qualified to help. Each question will be answered by mail and those of general interest will be published each month. Address all communications to Consultation Service, *Postgraduate Medicine*, 512 Essex Building, Minneapolis 2, Minnesota.

## NEPHROSIS

*QUESTION: 1. In a child aged 7 with massive albuminuria and anasarca, without hypertension, hematuria or azotemia, is one justified in diagnosing "pure nephrosis"?*

*M.D.—Missouri*

ANSWER: This is the nephrotic syndrome. It occurs most commonly as a stage or phase in the course of glomerulonephritis or as a result of the action of some poisons such as mercuric chloride. Extremely rarely a "pure or lipoid nephrosis" seems to exist without evidences of glomerulonephritis or poisons.

*2. Is nephrosis a tubular disease and nephritis essentially a glomerular disease?*

ANSWER: No. Abnormality of both tubules and glomeruli exists in both nephrosis and nephritis. In nephrosis the glomerular capillaries are abnormally permeable just as are the capillaries throughout the body with the resulting loss of plasma protein; tubular absorption of water and sodium chloride from the glomerular filtrate is not impaired. Albuminuria and generalized edema results. Hypoproteinemia is common as a result of the albuminuria and high-protein edema fluid and the impaired gastrointestinal absorption and hepatic utilization of nitrogenous foods but the abnormal capillary permeability seems to be the primary factor. Tubular destruction found in fatal cases of mercuric chloride poisoning is not indicative of the pathologic physiology of the nephrotic syndrome. In nephritis there are inflammatory changes in the glomeruli as well as abnormal capillary permeability.

*3. What is the usual course and prognosis of nephrosis?*

ANSWER: The course of the nephrotic syndrome varies with its etiology and is very often complicated by so-called nephrotic crises of peritonitis, pleuritis, etc., due to pneumococcus, streptococcus or other bacteria. If the patient survives these crises, which is more frequent since specific chemotherapy (sulfonamides, penicillin and amino-acid solutions) for parenteral administration have become available, recovery from the nephrotic syndrome is frequent. The fundamental therapeutic problem is the detection and elimination of the cause of the abnormal capillary permeability, be this a poison such as mercury or an infection such as an alveolar abscess or a pharyngitis. Diuretic measures are important to minimize the edema which interferes with the function and nutrition of all tissues and organs of the body. If etiologic factors and edema can be controlled, the prognosis is good.

## COCCYX DEFORMITY

*QUESTION: How frequently is a previous fracture or a deformity of the coccyx a factor in dystocia? Is cesarean section indicated in a multipara who had a previous normal delivery except for severe postpartum pain in the region of the coccyx and some third stage delay?*

*M.D.—Ohio*

ANSWER: It is not likely that a previous fracture, deformity, or fixed antelexion of the coccyx may be a factor in dystocia. The patient cited probably had a contraction of the pelvic outlet, as with a narrowed subpubic arch and transverse diameter without compensatory lengthening of the posterior sagittal diameter. It is in the latter diameter that the coccyx becomes one point in the several producing outlet dystocia.

This patient should not require a cesarean section based solely on the symptoms noted at the time of her first delivery. Does not the questioner mean late second stage delay rather than third stage delay?

## DIZZINESS ASSOCIATED WITH PREGNANCY

*QUESTION: What is the etiology, frequency, and treatment of dizziness in normal pregnancy?*

*M.D.—North Dakota*

**ANSWER:** Dizziness during pregnancy may originate from several causes and is not common to early pregnancy. It is usually a manifestation of some abnormality, and treatment depends upon its cause.

Disturbances of eyes and ears must be considered; anemia may produce this symptom; dizziness may be one manifestation of toxemia early in pregnancy with nausea and vomiting; it often accompanies toxemia late in pregnancy of the hypertension type.

Vasomotor disturbances, and the usual overactivity of the pituitary during pregnancy could be causative factors. It is not usually a symptom of noteworthy significance except in toxemia of late pregnancy. It may be more annoying than serious.

## PERNICIOUS ANEMIA

*QUESTION: A patient, 68 years old, with pernicious anemia, treated with liver for two years, has developed numbness and tingling in the toes but not the fingers. Vibration and joint sense are moderately diminished in the feet only. Can a diagnosis of subacute combined sclerosis be made? Are thyroid, or vitamin B of value? Is crude liver preferable to the ordinary parenteral liver concentrates in this complication?*

*M.D.—Illinois*

**ANSWER:** From the findings, it is certainly presumptive evidence that the person has subacute combined sclerosis and would indicate that he had not had adequate amounts of liver extract. The

amount necessary is much greater for some persons than it is for others. Frequent injections are more effective per unit of material than are infrequent ones. Thyroid and vitamin B are of little or no value on theoretical grounds. Crude liver is preferable to the refined preparations, but even the most potent liver concentrations seem to have this material in them. If the patient has any sort of systemic reactions to the crude liver preparations, I certainly would stick to the highly concentrated ones.

## COMPRESSION FRACTURES OF VERTEBRAE

*QUESTION: I have a patient with a slight compression fracture of the body of the sixth thoracic vertebra. The orthopedic consultant advised treatment by bed rest only, but with a board under the upper part of the mattress. The patient is in good condition and was free from pain at the end of three weeks. The consultant believes the patient can walk by the end of the seventh week and probably resume very light work if the x-ray checkup at that time reveals the anticipated progress. Can compression fractures of the vertebrae heal so quickly, or is this probably a hazardous plan of treatment?*

*M.D.—Wisconsin*

**ANSWER:** Compression fractures of vertebrae do not heal in six weeks. However, in slight compression fractures of upper thoracic vertebrae there is moderate support given by the thoracic cage, permitting guarded activity at this early stage. Careful observation should be continued. Vigorous activity should be avoided, and this applied particularly to lifting and bending strains. If pain recurs, recumbency should be resumed and external support applied. Complete healing of the injured vertebrae cannot be anticipated within twelve weeks. Healing is evident when, clinically, local tenderness has disappeared and, in the x-rays, there is no evidence of further compression.

The above conditions apply to a middle aged patient in good general condition. The variables of age, physical type, nutrition, and normal activity must be taken into consideration.

# Men of Medicine

## FROM THE OLD SCHOOL TO THE NEW

THE comfortably old-fashioned home of Dr. Rudolph Matas is a storehouse of memories. Behind each painting, each bit of bric-a-brac, is a story, which the doctor, spry for all his 87 years, loves to relate in his soft, friendly voice.

The cellophane-covered bas relief of Lafcadio Hearn, for instance, recalls the days nearly sixty-five years ago when the 23-year-old doctor and the writer walked through the quiet New Orleans night developing the patterns for some of Hearn's literary masterpieces.

Matas had been graduated from Tulane University shortly before, and in addition to practicing medicine was editing the *New Orleans Surgical and Medical Journal*. He had become acquainted with Hearn through reading his translations of de Maupassant, Gautier, Loti, and Zola. It was at this time that Hearn was forming his fantastic stories and he drew liberally from the young doctor's vast knowledge of medical lore.

On a table in the living room is one of Dr. Matas' most cherished scrapbooks. It is an account of his trip to Havana, Cuba, in 1940 when he was honored as the only living man who had worked with Dr. Carlos J. Finlay, the discoverer of the insect carrier of yellow fever. Dr. Matas was a member of the yellow fever commission sent to Cuba during the yellow fever outbreak there, and is the commander of the National Cuban Order of Carlos Finlay. The occasion of Dr. Matas' visit was the 100th anniversary of Dr. Finlay's birth.

In another corner of Dr. Matas' living room is a marble bust of his late wife, carefully covered with white paper to keep off the dust. She died in 1918, leaving a son by her first marriage, and later one of Dr. Matas' students in medical school.

In another corner of the room is another reminder of Dr. Matas' wife—a player piano and a case

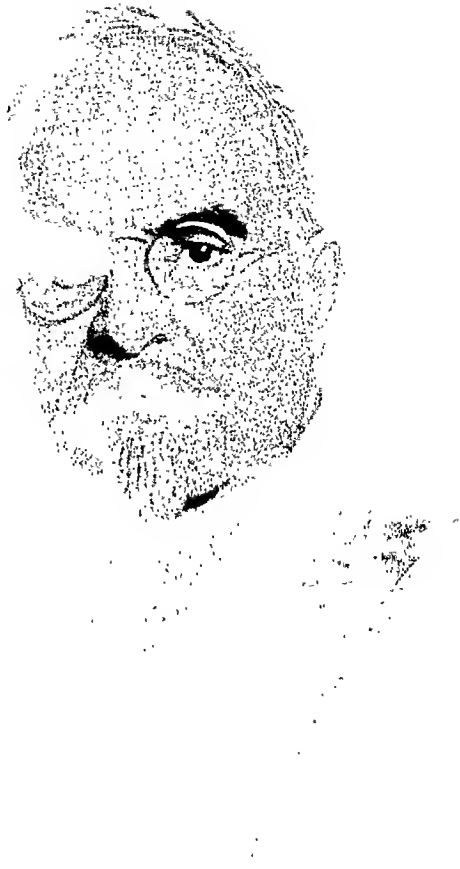
containing a large number of player piano rolls. She and Dr. Matas had spent many evenings together alone with that instrument, playing works of Bach, Beethoven and Brahms; and other great composers, of which both were very fond. Early in his youth, he had taken piano lessons from a very exacting teacher, but when the young man started to practice medicine, he had to drop his studies.

Dr. Matas is short and rather stockily built, with white hair and white beard and mustache. Although somewhat bent with age, his manner is youthful and he is as much interested in the future as in the past. This spring he was busy leading a fund campaign for a New Orleans hospital but he took time off to fly to Atlantic City for the convention of the American Medical Association, and then on to Boston.

He is an ardent bibliophile; on his library shelves are many priceless volumes of medical and surgical periodicals, and medical history. A china cabinet in the room is filled with letters, documents and other papers, material for an 11-volume history of Louisiana medicine and of the Louisiana State Medical Society, which he, with Mrs. Slattery Aleman, is writing with the hope that the Louisiana legislature will provide funds for its publication.

The publication of the history is only one of his many current projects. Another is the revival of the International Surgical Society, which became disorganized during World War II. As the original president of the society and now the secretary-general, he has a keen interest in its being perpetuated to keep high the standards of surgery throughout the world. In September the 87-year-old surgeon will fly to London to attend the society's first post-war meeting.

His conversation ranges far and wide—from a trip he had once made to view the Matterhorn to



FROM THE PAINTING BY THOMAS C. CORNER

COURTESY, AMERICAN COLLEGE OF SURGEONS

*Rudolph Matas*

*This portrait reproduction was presented to POSTGRADUATE MEDICINE by Ethicon Suture Laboratories.*



his original operation for aneurysm which had brought him his greatest renown.

The way to the dining room in the Matas home leads down a long hall, furnished with such varied items as bronze lamp stands, bookcases and an old-fashioned music box that plays records a yard in diameter, with beautiful and rich tones.

The long dining table is set in a high-ceilinged room, with a huge high-mirrored sideboard on one side. At one end are two china cabinets. The innumerable trinkets in one, Dr. Matas explains, are objects that he had picked up during his travels in Europe. When his friends and former students bring their children and grandchildren with them on their visits, these trinkets are wonderful playthings.

The other china cabinet is filled with his "trophies." Practically all are silver, and range from teacups to very elaborate and ornate loving cups. They are souvenirs of many surgical operations, presented by patients cured by his skilled hands and alert mind.

Dr. Matas' stories and anecdotes reflect what he has written in his famous monograph, "The Soul of the Surgeon," that the life of a surgeon, "though a hard one, is indeed a beautiful life."

"It is, indeed, an impassioned and troubled life, that is ours," he wrote. "One in which we can scarcely claim a single moment of mental ease and quiet. It has its great joys, its superb and glorious hours; but it also has its tragic hours, its hours of bitterness and desolation. And yet, the real honest surgeons all love it. They love it in spite of its fatigue, its worries and its emotions."

HE was a horse and buggy doctor in his early days, performing many operations by candlelight or the light of the oil lamp, in the homes of his patients and in the hotel rooms.

One early experience in surgery left a deep impression on Dr. Matas' memory. As an intern he had gone with Dr. Richardson of Tulane to assist him in an operation at the St. Charles Hotel. The patient was the sister of Jefferson Davis, former president of the Confederate States. Dr. Richardson carried her gently from her bed and placed her on the operating table in the adjoining room.

"Dr. Richardson was a splendid, tall, strong man," Dr. Matas relates. "When the operation was completed he took her in his arms, laid her gently back into the bed, and kissed her. I shall never forget that."

Operating in hotels and homes, before there were the hospital facilities, that we have today, he said, was not so easy.

"I remember I was called to perform an operation in a patient's home during a terrific thunderstorm. The lightning was flashing everywhere and every instrument I picked up seemed to be charged with electricity."

He is glad that advances in science have taken care of many of the factors that were nightmares in the surgeon's life.

"Many times we had to hitch up the horses and drive frantically in the response to a call from a hysterical mother whose child was dying of diphtheria. Often we would hardly have time to pick any instruments to take with us. Sometimes when we would cut into the suffocating child's swollen throat, the blood would shoot out. The mother, holding a lamp over the child for us to see, would faint and drop the lamp. We would have to pick up anything we could find to thrust into the child's windpipe to hold it open and at the same time see that the house did not catch fire. Thank goodness, diphtheria immunization has put an end to those nightmares."

But the old days were not all nightmares. There was compensating amusement and adventure. Dr. Matas can recall the old duelling days in New Orleans when as many as six victims were brought to the hospitals with injuries every twenty-four hours.

"I was a surgeon at the last duel fought in New Orleans. Two young cocks were members of old aristocratic families that had lost their money. They started an argument over a drug store counter where one of them was dispensing sodas. So they decided to fight it out, choosing foils as their weapons.

"They selected as their seconds a couple of fencing instructors who had made good money in the old, duelling days, training the fighters. When the time came for the duel another medical man and I were selected as the surgeons to treat their



wounds. We two got the boys together and agreed that the duel would stop as soon as the first blood was drawn.

"The seconds were not very happy about that, because they wanted to see a real fight.

"The two had not slashed at each other very long before one was nicked in the arm.

"First blood,' I said, holding up my hand for them to stop. 'First blood,' said the other surgeon.

"The youngsters relaxed and we all looked very carefully at the arm in question.

"Only a mosquito bite,' said the disappointed seconds.

"No, that's blood,' I said, giving the arm very close inspection.

"He's right,' agreed the other surgeon. "That's blood. The duel's over."

"The boys agreed, and laid down their weapons. And I never saw two happier young men; they were so thankful that the duel was over and the point of honor had been settled without any more perceptible amount of bloodshed."

Long after, when duels were a memory in the minds of the people of New Orleans, and many doctors had taken to the automobile, Dr. Matas kept his horse and buggy.

"But one of my colleagues was so anxious to expand his practice that he would keep the harness suspended over the back of his horses, as was the practice in the fire engine houses, so that he could have the animals hitched and get to his patients as soon as possible. To be sure he was the first to recognize the possibilities of the automobile and was one of the first to buy one.

"Then he persuaded me to get one. But I could not master it. I would keep running into a tree or a fire plug. I found that to drive a car successfully I had to keep my mind on that and nothing else. But I was forever thinking about my patients and other work I had to do. So I gave up driving."

Sometimes as often as once a week, he would stay up all night without sleep. On one occasion he stayed up for fifteen nights in succession, putting in a full day's work in the hospital and at Tulane University.

"I was glad to be relieved of the discipline of teaching," said Dr. Matas, who retired as professor of surgery at Tulane in 1927. He had taken that

post in 1895, and had been demonstrator in anatomy at Tulane for ten years previously. "That bell would ring always at the same time, regardless of how late I had been up the night before. And regardless of how late I had been up, or whether I had gone to bed at all, I had to keep my mind clear. I am glad I don't have to hear that bell any longer."

DR. MATAS was a gentle instructor. It is said his students and internes would "follow him around like puppy dogs." He was a liberal grader. If on their examinations some of the boys received grades he thought were too low, he would raise them. He also would never ask a student to do something he would not do himself, and he always set an example of hard and diligent effort. He was reluctant to let a student fail in his final year at medical school, believing that if a student were unable to get through medical school and make a good doctor, this would have shown up long before he had reached the final year.

In starting out as professor of surgery, he began the practice of having monthly examinations, and if the students passed the monthly examinations they would not have to take the finals. It was soon discovered that the medical students were studying surgery to the exclusion of most of their other subjects. So this practice had to be stopped.

Dr. Matas said he belongs to many clubs but doesn't go to any. He has never been active in any sports.

"If I had it to do again, I think I might have indulged in sports," he remarked. "I think tennis is a wonderful thing to exercise the muscles of the body. Golf has been a fine thing in bringing diplomats together. The British have used golf for many years in bringing about favorable treaties. And I think bridge would be good as a form of mental activity."

But Dr. Matas' home is a center of his life.

"I love my home above everything else. I have a limited circle of friends—friends who are staunch and believe in my honesty. I like to invite them in for good conversation."

He is not a recluse, by any means. He loves New Orleans and seems to know every cranny of that

ancient and colorful city. He is widely known in New Orleans not only as a man who has helped bring fame to the city, but also as an ordinary citizen. In the French quarter, a driver of a sight-seeing cab hailed him with "Hello, Dr. Matas. How are you today?" This is typical of the reception he enjoys.

He is one of the city's and the state's most steadfast citizens. He writes letters to editors and members of the state legislature, urging measures for good government. He also speaks at meetings of citizens' committees. When Huey Long was governor and wanted to appoint staff members of the Charity Hospital at New Orleans on the basis of politics, Dr. Matas became a thorn in the King Fish's side.

Nowadays Dr. Matas works at home in the rooms upstairs. He seldom goes to his office except for an occasional consultation. Upstairs, as down, books are to be found in abundance, and in many languages.

Dr. Matas as a young man had learned Latin from an exiled anti-czarist prince in Mexico, who "was intoxicated with the splendors of ancient Roman oratory." He learned Greek from a Presbyterian minister in Mexico. His early education was obtained in Paris, Barcelona, Spain; Brownsville, Texas; Matamoras, Mexico, and New Orleans. So he can speak French, Spanish and the Catalan dialect. He can also speak Italian. His linguistic range made him a marvel to his interns. As he went from bed to bed in the hospitals he would address his patients in English, French, Spanish or Italian.

DR. MATAS subscribes to all important surgical journals from the United States, France, England, Spain and Germany, and has had them bound and placed on the shelves in his library for reference. Those who in the past have been amazed at the thoroughness of his knowledge and his prodigious memory when he took part in a discussion at a scientific meeting, probably were not aware that he had consulted all the material of any value that had been published.

Having performed more operations in vascular surgery than any other individual, he has made

abstracts of everything that has been written on the subject. His notes fill 37 letter cases, sufficient material for two or three large volumes.

In his library are trunks of photographs of his work, his travels, stacks of diaries and scrapbooks on many subjects, enough to fill many volumes of work valuable to the doctor, scientist, and general reader.

Besides his desk in his well-stocked library is a couch which is a depository for his current mail—letters from friends, colleagues and others all over the world, popular magazines, medical and scientific journals. In every room on the second floor are books and magazines, beautiful and rare histories of Spain and his ancestral Catalonia; popular novels that he and his wife read together; works by many authors great and near great, in many languages. There are thousands of volumes showing a wide and catholic taste.

In his own bedroom is a table piled with current magazines, and a bookcase, filled with current books of all kinds, stands close to his tall, four-poster bed.

"Every time I go to bed at night these books say: 'When are you ever going to get around to reading us?' I do the best I can, and read practically every night," Dr. Matas commented.

Laid out on a table in another room is an array of velvet-lined jewel cases containing medals awarded him for his achievements in surgery. There is the famous Bigelow medal, more than three inches in diameter.

"That's solid gold," Dr. Matas commented. "There must be more than \$100 worth of gold in that."

Picking up the medal given him in Madrid in 1932 when he was made a Knight of the Civil Order of Alfonso XII of Spain, he said "That is certainly a beautiful piece of work." He was made an Officer of the Order of Public Instructors in Venezuela in 1925; a Chevalier of the Legion of Honor in France in 1932; a Knight of the Order of Isabelle the Catholic in Spain in 1934; a Commander of the National Cuban Order of Carlos Finlay in Havana; an Officer of the Order of Leopold in Belgium in 1939, and was the recipient of the first distinguished service medal of the American Medical Association in 1938.

Dr. Matas' medal collection is rivalled by his many parchments representing other honors. He has received honorary degrees of doctor of laws from Washington University, the University of Alabama, and Tulane University, and honorary degrees of doctor of science from the University of Pennsylvania and Princeton, and the *honoris causa* from the University of Guatamala.

"There are more documents than this," he said. A large suitcase was packed full of more diplomas; honorary presidency of the International Surgical Congress, honorary membership in the Royal Academy of Medicine at Rome, in the Association of Polish Surgeons, and the Society of Italian Physicians in America; corresponding membership in the Peruvian Surgical Society, Societe Nationale de Chirurgie of France, Medical Society of Copenhagen and the Surgical Society of Madrid; corresponding fellowship in the Royal Academy of Medicine and the Catalonian Medical Society; honorary presidency of the Surgical Society of Barcelona, membership in the Society Internationale pour l' Histor de la Medicine of France, and others.

These honors have come to him as a great pioneer in surgery, who lived in a period when surgeons were given their greatest opportunity in history to show what their science and art could do in the healing of human ills.

Most famous for his vascular surgery, Dr. Matas up to 1940, had performed 617 operations in this field, of which 248 were for aneurysms. His early interest in aneurysms is attributable to the fact that the successful ligation of the great arteries for aneurysm was regarded as one of the outstanding accomplishments for surgery.

Possibilities of improving upon this form of surgery provided a powerful incentive to young men entering this field. Dr. Matas' cures with his method of endo-aneurysmorrhaphy brought worldwide attention. It was considered the greatest achievement in this field since John Hunter's ligation in 1785. In the fifty-eight years since Dr. Matas performed his first operation of this type no significant alterations in the technic have been made.

In his pioneering work in vascular surgery, he and his colleagues developed the Matas-Allen band—a flexible, flat, removable aluminum band for

the occlusion of the large arteries. He developed a method for testing the efficiency of the collateral circulation as a preliminary to the occlusion of these vessels. He also developed a method for reducing the calibre of the thoracic aorta by the plication or unfolding of its walls by lateral suture.

Grateful to Dr. Matas for the prolongation of her life through his vascular surgery, the late Miss Violet Ida Hart in 1933 created the Rudolph Matas award, and a gold medal, the Matas Medal, to be given at intervals for the most outstanding work in that field. Only one other surgical distinction as great as the Matas medal exists in the United States today. That is the Bigelow Medal, conferred for general surgery by the Boston Surgical Society in memory of Dr. Henry James Bigelow.

Dr. Matas was the first to use the intravenous drip method for the administration of glucose and saline solution, and the first to extend a tube into the stomach for drainage in intestinal obstruction. He was also one of the first surgeons successful in the removal of the larynx.

Developing a special form of air pump, Dr. Matas was the first surgeon in the United States to apply positive pressure to permit the patient to continue breathing while undergoing surgery of the thorax.

In the surgery of jaw fractures he made notable contributions. He developed a new method of reducing and securing the fixation of displaced fragments in zygomatic fractures. He also applied a simple expedient in treating complicated fractures of the lower jaw in conditions forbidding the use of splints or intrabuccal prosthesis.

In all, Dr. Matas has published 400 papers, describing his achievements and contributed chapters in many books on surgery; has invented 10 major devices in surgical operations and developed 26 major surgical procedures.

THE humble and unassuming author of these brilliant achievements is a descendant of sturdy, long-lived, prolific and industrious Catalonian ancestors. His father, Dr. Narcissus Heréu Matas, and his mother, Theresa Jorda Ponsjoan Matas, were each one of a family of nine children, born in Catalonia.

Immediately after their marriage, his parents migrated from Europe to New Orleans, where Dr. Narcissus Matas established a pharmacy, and started to study English and medicine at the New Orleans School of Medicine, where he was graduated in 1859. Shortly after his graduation fire destroyed the pharmacy, and he and the family moved to Bonnet Carre, Louisiana.

THE renowned New Orleans surgeon was born September 12, 1860, in that town which was subsequently washed away in a Mississippi River flood. The father's medical career was interrupted by the Civil War, and after a successful venture in the cattle business, he took his family to Paris in 1864, where he studied ophthalmology. Young Matas had not learned to speak English. His infant words were Spanish, but in Paris he learned French. Two years later the family moved to Barcelona, Spain, where the father established himself as a licentiate of the University of Barcelona and a specialist in ophthalmology.

They remained in Spain until 1867, when the family returned to America. By that time the boy had learned to speak French, Spanish and Catalan fluently. Yellow fever was raging in New Orleans, and young Rudolph suffered his first of four different attacks.

They moved out of the city and went to the Rio Grande Valley, where the elder Matas found a remunerative medical practice with a wealthy Spanish firm that engaged him to take care of its employees in Brownsville, Texas, and Matamoras, Mexico.

Young Matas learned to speak English at the Brownsville public schools. In 1870 he was sent to New Orleans to study in the literary department of Soule's College for two years. Returning to Matamoras, he was graduated from the Literary Institute of St. John in 1876.

"I found the going hard; and the Mexican Indians in the school gave me such stiff competition that I became ashamed of myself," Dr. Matas recalled. "They had a phenomenal memory and ability to learn. I decided I had to get the better of those fellows, and as a consequence I acquired a great deal of knowledge—the result of vanity."

After school hours, young Matas worked in a pharmacy belonging to a friend of his father's at Matamoras, and acquired a great deal of knowledge of therapeutics and materia medica. This gave him a head start when he matriculated at the Medical School of the University of Louisiana, which is now Tulane. He progressed rapidly, and in 1877 won in competitive examination the post of resident intern at Charity Hospital. Upon his graduation in 1880 he became chief of the clinics at the hospital and demonstrator in anatomy. He became professor of surgery in 1895 and started specializing in that field at that time.

The spirit of revolt against the ancient methods of surgery was in the air at that time. In almost every direction surgery offered a challenge to the young, imaginative, inquisitive and active mind.

Soon after his graduation Dr. Matas visited the hospitals in Paris, studying their methods, and spent a summer in the University of Barcelona. There were no graduate schools at that time in the United States, but he endeavored to improve his opportunities in anatomy and surgery by visiting in New York, Boston, Chicago, and Washington, where he spent a good part of his summers in the Surgeon General's Library, through the friendship of Dr. John Shaw Billings.

His brilliancy, his conscientiousness and other high qualities early in his career gained him the high esteem of the people of New Orleans. When the death of Dr. A. B. Miles in 1893 left the chair of surgery at Tulane vacant, the university began seeking a successor in other cities. The doctors of the city, the general public and the newspapers went up in arms. They demanded that Dr. Matas be appointed to fill the post. The people wrote letters to the newspapers, the newspapers carried stories and editorials day after day demanding his appointment to the chair, and the university finally relented.

Dr. Matas' activities in addition to his practice and teaching have been extensive. In 1887-88 he was one of the organizers of the first polyclinic postgraduate school in New Orleans, in which he conducted for nearly nine years a course in operative surgery and surgical anatomy.

Shortly after his graduation from Tulane, he was elected physician to a benevolent association,

one of the many cooperative societies in New Orleans. He cared for more than 300 families with an annual remuneration of \$600.

In one of the halls of the Touro Infirmary, one of the large and modern hospitals in New Orleans, is a large bronze portrait medallion of Dr. Matas. He was chief of the surgical staff there from 1907 to 1935, and in the early years of his teaching brought his students there for study. Dr. Matas was to a great extent responsible for the success of Touro Infirmary. The portrait was presented to the hospital in recognition of his efforts in promoting that institution. In recognition of his contributions of books, journals, time, and effort to the medical library at Tulane, it was named the Rudolph Matas Medical Library.

In addition to supporting these and other New Orleans institutions, Dr. Matas has been the leading exponent of medical education in Louisiana. During his presidency of the Louisiana State Medical Association in 1894 and 1895, he was largely responsible for the Louisiana State Medical Practice Act. He has been a relentless leader in every effort during most of the last fifty years to improve the city's sanitation and public health. As a result of much of this local effort, he was given the New Orleans Times-Picayune award for community service in 1940. He boldly and persistently fought public opinion for years in bringing protection for the people of Louisiana against yellow fever, malaria, typhoid, typhus, cholera, bubonic plague, smallpox, diphtheria, and scarlet fever.

**A**MONG his many other activities, Dr. Matas was the organizer and director of Tulane Unit, Base Hospital 24 for service in France, director of the New Orleans School for Intensive Surgical War Training during World War I, former president of the American Surgical Association, the Southern Surgical Association, American Association of Thoracic Surgeons, Louisiana State Medical Association, New Orleans Medical and Surgical Association, and former vice president of the American Medical Association, American Society for Clinical Surgery, and the Pan-American Medical

Congress, of which he was also honorary president.

His is an honorary fellow of the Royal College of Surgeons in England, and honorary member of the New Orleans Illinois Central and Mississippi Valley Railroad Surgeons, American Association for Traumatic Surgery, New York Academy of Medicine, American Society for Regional Anesthesia, Boston Surgical Society, American Society for the History of Medicine, and the Philadelphia Academy of Surgery.

He was a member and rapporteur on arterial surgery at the International Medical Congress in London in 1913, member of the Association Française de Chirurgie, rapporteur and by invitation an honorary president in 1922, and honorary president of the International Surgical Congress in Warsaw in 1929.

As one of the organizers and a former president of the American College of Surgeons, he has fought for higher standards throughout the nation in that profession.

In a speech in 1932 he expressed the opinion that the medical profession, "and especially the surgical branch of it, I am ashamed to say, is infested like the tropical seas, with numerous sharks who prey and fasten themselves upon their suffering and helpless fellows. To any thoughtful observer, the evidence must be convincing to prove that while immense and stupendous progress in lines of efficiency, has been accomplished in medicine in the lifetime of the present generation, the teaching of the principles of honest dealing and righteous conduct have suffered and failed to keep pace with the intellectual and scientific advance of the age. In this we are not singular, but suffer as all other professions, from the general moral laxity that seems to pervade the whole social and political fabric of our civilization." He still holds to that belief and still is fighting against frauds in his profession.

Dr. Matas said he has subordinated practically everything for his work.

"I do not believe that is always the best thing, but I have loved my profession," he commented. "I have tried to be temperate and have tried to keep the commandments."

# Book of the Month— A Report

## SURGICAL PATHOLOGY\*

EVERY surgeon will find the sixth edition of William Boyd's "Surgical Pathology" a stimulating and helpful volume. From the first edition through all the subsequent revisions this work has presented pathology in a manner that is encountered in the operating room.

The author states that the early pathologic changes in tissue are the most important to the surgeon because he is called upon to handle problems at the time of an operation and his decision many times will be based on these changes. It is with this idea that the material is presented.

The material is well organized and is presented in a direct orderly manner. The first nine chapters deal with general pathologic material which is of surgical importance. The remaining twenty-five chapters deal with the pathology of organs or systems. The style is clear and to the point. In the more important conditions, the discussion is based on the pathogenesis, etiology, morbid anatomy, pathologic physiology, complications and prognosis. It makes for a comprehensive discussion and the author has the ability to give the essential facts in an easy, readable form. The author purposely includes the summarization of the clinical features of many conditions for the purpose of demonstrating the relation of pathology to symptomatology.

The new material added to this edition is a section on the pathology and pathologic physiology of congenital heart disease because this condition has recently come under the realm of surgery. The other new material presented includes tumors of

the larynx, pinealoma, Bittner's milk factor in relation to breast carcinoma, avitaminosis in cancer of the mouth, the Papanicolaou vaginal smear method in diagnosing carcinoma of the cervix, fibrous dysplasia of bone, inflammatory nodules of muscles in chronic arthritis and fibrositis of the back.

Following each chapter there is a well chosen list of references. The references are grouped according to various phases of the subject under discussion. This makes it easier to pick references for study of the particular phase on which one wants more detailed information. In looking through the references one sees that the author has utilized many current articles which undoubtedly has made this volume such a timely and current handbook for the surgeon. Only the most important references on the subject are given. A reference in a foreign language is only given when such information is not obtained in English.

The chapter on inflammation and repair is full of basic information having a direct bearing on surgical practice. "Inflammation is the most important as it is the most universal of all pathologic processes. Being the local reaction of the living tissues to an irritant, it follows that some degree of inflammatory change is present wherever the tissues are subjected to the action of an irritant. No matter, therefore, how aseptic an operation may be, it must inevitably be accompanied by some degree of inflammation."

There are three main phases of the inflammatory process, namely, the vascular changes, the formation of the inflammatory exudate and the process of repair. Each of these phases has a specific function: "The vascular changes are not intelligent responses, nervous in origin, but are due to

\*Surgical Pathology. By William Boyd, M.D., Professor of Pathology, The University of Toronto, Canada. Sixth Edition. 858 pages, with 530 illustrations, including 22 color figures. Philadelphia and London: W. B. Saunders Company, 1947. Price \$10.00.

the action of the irritant on the walls of the vessels. The walls of the small arteries and veins are of course largely composed of muscle, but the investigations of Krogh have shown that the capillaries are also actively contractile tubes. The dilatation of the vessels, with the accompanying engorgement and transudation, are due to the irritant paralyzing the contractile elements in the vessel walls.

"Within recent years Menkin has published a series of experimental studies on the mechanism of inflammation, now collected into a monograph entitled 'The Dynamics of Inflammation.' He has succeeded in isolating chemical factors from experimentally produced inflammatory exudates, factors which appear to play an important part in the mechanism of the process. One of these factors, which he calls leucotaxine, induces a prompt increase in the permeability of normal capillaries. It seems to be an intermediary breakdown product of protein metabolism. When this substance is injected locally the increased capillary permeability is followed by the rapid migration of polymorphonuclear leucocytes. It is definitely chemotactic. Another factor in the exudate is capable of causing marked leucocytosis in the normal animal. This factor does not appear to be related to leucotaxine.

"Sir Thomas Lewis has suggested that a histamine-like substance, which he calls H substance, is liberated at the site of inflammation, and that this is responsible for the increased vascular permeability. The evidence in support of this appears to be less conclusive than in the case of Menkin's leucotaxic factor."

In chapter six, entitled, "Hemorrhage, Thrombosis and Embolism," the problems of blood loss and the mechanization of control are discussed. The uses of heparin, dicumarol and vitamin K are presented.

The thrombo-embolic phenomenon is discussed at some length. This condition has assumed considerable importance recently because of the controversy that has developed in regard to treatment and management of intravascular thrombosis. The author differentiates the thrombosis into two groups. When the thrombosis is associated and dependent on inflammation of the vein wall the process is called thrombophlebitis. Venous thrombosis is the process where there is not an associated in-

flammation. The bland thrombus is one responsible for the pulmonary embolic phenomena.

Postoperative embolic phenomena fall into three groups: (1) large emboli occluding the pulmonary artery or a main branch with a fatal outcome in 90 per cent of the cases occurring in the matter of a few minutes, (2) emboli of moderate size which cause hemorrhagic infarction and consolidation causing pleuritic symptoms having a mortality of 15 to 20 per cent, and (3) small emboli causing mild symptoms with few or no physical signs and producing no deaths.

The chapter on tumors is developed by a discussion on etiology, spread of tumors, radiation of tumors, and classification. The author shows the relationship of carcinogenic hydrocarbons and estrogenic substances. In controlled mice experiments mammary cancer has been produced by estrin. It is postulated that estrogenic substances may be one of the factors in the complex process of neoplasia.

The section on radiation of tumors gives the surgeon fundamental information on this phase of tumor treatment. It is not intended to be comprehensive and detailed but sets forth the basic knowledge of radiotherapy. The biologic effect of the gamma rays of radium and of x-rays are given. The principles of radio sensitivity are presented and the effect of radiation is discussed, both as to its action on the tumor and its action on the tumor bed. Such information is helpful to a surgeon when referring a tumor case to a radiologist for therapy.

THE problem of peptic ulcer is presented in a detailed, thorough manner. Peptic ulcer, especially the duodenal type, has increased in frequency. Seventy per cent of the chronic ulcers coming to operation at the Toronto General Hospital were in the duodenum and thirty per cent were in the stomach. The surgeon probably sees a special class of cases, those having symptoms of obstruction or hemorrhage or perforation. At the same hospital the autopsy material revealed that the chronic ulcers were slightly more frequent in the stomach.

It seems probable that not more than 5 per cent of cancers developed from ulcer. Very much less than 5 per cent of ulcer became malignant. Malignant



Carcinoma of the breast associated with lobular hyperplasia.



The cells of a medullary carcinoma of the breast; one mitotic figure. x 500.



Illustrations from: *Surgical Pathology by Boyd*  
Intracanalicular fibro-adenoma. x 175.



Lobular hyperplasia, cystic. Epithelial hyperplasia with papillary processes projecting into cysts. x 125.



nant change in a duodenal ulcer probably never occurs.

Carcinoma of the stomach is classified into two chief types on the basis of the malignant cell, the cylindrical cell tumors, and the spheroidal cell tumors. The cylindrical cell tumor occurs as an adenocarcinoma or the cells may be arranged in solid masses. The spheroidal cell growths are usually diffusely infiltrating. Where the connective tissue stroma is abundant, the tumor is of the scirrhus type. Gelatinous degeneration may occur in either the cylindrical or spheroidal cell tumor and so called colloid cancer is formed.

The author considers a classification based on the gross appearance more satisfactory for the clinician, namely, (1) papillar, (2) ulcerating, and (3) diffuse infiltrating. He agrees with the dictum of MacCarty that if an ulcer has a diameter of more than 2 cm. it is likely to be malignant but cautions that there are many exceptions.

The pathology of the breast is devoted mostly to a discussion of chronic mastitis and carcinoma. The other lesions of the breast are discussed but, because of their importance, chronic mastitis and carcinoma are covered in greater detail.

Chronic mastitis the author states "is the root and center of all the difficulties in breast pathology." The condition is known by many various names. The author uses chronic mastitis but he thinks the term lobular hyperplasia of the breast, with its subdivision of localized or generalized, and cystic and non-cystic is preferable because it describes the basic pathological entity.

**T**HE author disagrees with the modern tendency to regard lobular hyperplasia as a dangerous, precancerous condition. To treat such conditions radically "reduces the surgeon to the level of a mere operator." The hyperplasia of the breast is the result of hormonal stimulation and such stimulation is considered to be a factor in the production of breast cancer. It is necessary that these breasts be examined regularly and in detail.

There are two factors detailed in the discussion of etiology of breast carcinoma. The first factor is the retention of irritating secretions in an inadequately drained duct system. Only 8.5 per cent of

mammary cancer patients give a normal nursing history. The second factor is an irregular or abnormal ovarian stimulus.

Lobular hyperplasia, fibro-adenoma and carcinoma in the breast are contrasted in a manner most helpful to the surgeon. "In each of these three conditions the patient complains of a lump in the breast. In chronic mastitis (lobular hyperplasia) there is a finely granular induration, often confined to one wedge-like section of the breast, which may be multiple, and which is only vaguely palpable to the palm of the hand. It is not adherent to the skin or deep fascia, the nipple is not retracted, and the axillary glands when enlarged are small and tender.

"In fibro-adenoma the mass is single or multiple, sharply circumscribed, not attached to the skin or deep fascia, and the axillary glands are not enlarged.

"In carcinoma the lump is single, hard, not confined to one sector, neither painful nor tender, palpable to the palm of the hand; the nipple may be retracted, and the axillary glands considerably enlarged but not tender.

"On section the mass in chronic mastitis is indefinite in outline, tough and indiarubbery in consistency, of a yellow-grey color, and cysts of varying size are common. The fibro-adenoma is circumscribed, encapsulated, and easily shelled out, firm, white in color, homogenous or finely granular, and when incised it feels hard, but neither tough nor gritty. Carcinoma is irregular in shape, indefinite in outline, firmly adherent to the surrounding fat, densely hard, grey in color but not homogenous looking, cuts with a peculiar gritty feel, and 'cancer juice' may be scraped from the surface.

"Carcinoma may arise in a breast already the seat of lobular hyperplasia, so that the two conditions frequently co-exist. It may also be associated with fibro-adenoma, but does not arise from conversion of that tumor into a malignant growth."

This volume covers practically every organ and system which comes under the surgeon's domain. The sections are well illustrated with carefully chosen photographs and microphotographs which makes for added clarity on the subject under discussion. Every surgeon will find that this volume will broaden his pathologic horizon.

# What Other Editors Think

## Editorial Evaluations of Current Contributions To Medical Progress

### POTASSIUM IN DIARRHEA

THE poor results so often obtained hitherto in the treatment of infantile diarrhea have been due to a false assumption, in the view of Darrow and of Govan and Darrow, that the potassium ion is retained in the cell while the sodium and chloride ions are excluded. These authors suggest that many therapeutic failures have resulted from the belief that it was necessary to restore the normal electrolyte balance only in the extracellular fluids.

Recent work has shown that certain cell membranes are permeable to potassium. Darrow and Govan attempt by somewhat complicated calculations to show exactly how much of the body potassium may be lost in cases of dehydration, quite apart from cell destruction. They conclude that in the most severe forms of infantile diarrhea as much as one-quarter of the estimated body potassium may be lost. With this in mind they have supplemented the usual glucose with potassium chloride. They claim that after giving the electrolyte mixture subcutaneously or intravenously for twenty-four hours they are able subsequently in most cases to give it by the oral route. All severely ill patients received blood or plasma transfusion.

The reluctance to administer potassium has been largely due to a well-founded distrust of giving an ion that is known at times to have toxic effects. Darrow had no deaths due to potassium toxemia, but one patient had heart block, and recovered; there were 5 instances of intense erythema in 50 patients. In 53 cases treated by the old method by the authors there were 17 deaths; in another series of 50 receiving potassium chloride in addition there were only 3 fatal cases. The groups were unfortunately not collateral and were admitted over different periods of the year, so that the observations were not strictly controlled. Nevertheless this line of therapy would be worth serious consideration.

*British Medical Journal*, No. 4503, p. 573.

### BIOPSY OF THE LIVER BY NEEDLE PUNCTURE

THERE have recently appeared articles on a needling type of biopsy of the liver in which tiny sausage-shaped bits of tissue are removed for section and histologic study. Obviously, if such a method is sufficiently safe, it can be very helpful in making a diagnosis in cases of a large liver of unknown origin, in following the later course of cases of infectious hepatitis, and in demonstrating the existence of primary carcinoma of the liver.

Today, even with all the many advances in the technic for diagnosing disease in the liver, there still remain cases in which it is impossible to say just what the lesion is. Sometimes, then, recourse is had to surgery and if the surgeon finds only a badly diseased liver and no obstruction of the common duct, he wishes devoutly that he could have spared the patient a largely futile and decidedly dangerous operation. Certainly any procedure that would lessen the need for these unfortunate operations would be welcomed by the gastroenterologist.

On searching the literature, it was found that the making of a biopsy of the liver with anesthesia or incision in the abdominal wall is not a new procedure. Before the dawn of this century it grew out of the well-known technic of needling the liver in a search for amebic abscesses, which was being used as early as 1835.

The big advance in technic appears to have been made in 1907 by Schupfer, who was a professor of medicine in Florence. He devised a needle with a sharp cutting edge all around the slightly flaring lower end. This knife-like edge cut a little core of tissue instead of tearing out pieces. The needle was about 8 cm. long with an outside diameter from 1.8 to 2 mm., and an inside diameter of from 1.4 to 1.5 mm.

In recent years most workers have employed a needle somewhat larger than was used at first. The

size of the needle is a compromise between one large enough to insure removal of a piece of liver adequate for sectioning and one small enough so that the danger of hemorrhage will be slight. Probably the two needles most often used now are the Silverman and the Roth-Turkel.

One of these instruments consists of an outer cannula with a sharp cutting edge, and an inner longer hollow needle split down the center with V-shaped cutting points. This inner needle, on introduction, tends to grasp a bit of liver tissue so that it can be more surely be removed. It seems best to insert the needle in front, pointing it upward into the liver substance. The patient must hold his breath, and it may help to immobilize the liver with the hand, granting that it can be felt through the abdominal wall. The needle is rotated when the physician begins to withdraw it.

Some writers have suggested performing the puncture while watching with a peritoneoscope passed through the abdominal wall nearby. Care must be taken not to push the needle into the liver so far that a large vessel can be punctured.

Dr. F. W. Hoffbauer writes that one of his colleagues, Dr. Varco, has found that with local anesthesia he can make a biopsy of the liver through a 6 cm. midline incision. Through this a piece of liver tissue can be removed and hemorrhage can be controlled by sutures. Hoffbauer believes that the amount of discomfort produced by this operation is about the same as that produced by peritoneoscopy.

In view of the many favorable results published, it would seem that the needle biopsy of the liver should be used more often. It certainly should be safer than is the type of surgical exploration now so often resorted to.

*George E. Brown, Jr., M.D., and Walter C. Alvarez, M.D., Gastroenterology, Vol. 8, No. 5, May 1947.*

### ALL BUT THEE AND ME

THE implications of an old story are becoming confused. It related how everybody was found a bit touched mentally, "all but thee and me," with the afterthought that "thee" might not be al-

together free from taint. In these days when the smattering of the terminology of psychology and psychiatry is common property the "me" of the story is turning the eye of suspicion upon himself along with the rest of the world.

The president and psychiatrist-in-chief of the Neuro-Psychiatric Institute of the Hartford Retreat in his annual report to the Board of Directors gave voice to a number of observations that should have wider publicity than is furnished by his pamphlet.

The report carries the considered opinion that mental illness is being increased instead of decreased by the present-day emphasis on psychiatric disorders. It has become widely accepted that mental illness must be attacked like tuberculosis and cancer, through a national alertness to early psychiatric disorders. The supporters of such a program can have given little thought to the inherent differences between these two definite diseases of the flesh and the variety and degree of the disorders to which the mind is subject. Of the effect of overstimulated interest in mental disorders, Dr. Burlingame says:

"Throughout the country, hundreds of thousands of persons, satiated with a superficial knowledge of the psychological implications of life and literally preoccupied with psychiatric terminology, are beginning to interpret every trivial thought and feeling in psychological terms. Consequently people in all walks of life are being instilled with the belief that they need psychiatric attention to save their minds if not their souls."

This is to say that too many of us are interpreting our emotions and reactions in terms of mental abnormality. We are not only searching our own psyche for the stigmata of mental disorder but we are on the lookout for such in the behavior of our friends and associates. It was bad enough when we fancied our psychiatrist friends were looking us over for evidence of a break in our mentalities, but to be thus studied by our lay friends is much more disconcerting. Again to quote the report:

"Too many people seem to be so lost in the morass of psychological jargon and theories that they are seeing psychiatric disorders in perfectly normal emotional swings. The popular tendency is to concentrate on the psychiatric dangers in ordinary everyday living in terms of 'That is what is wrong with me. It is because of these psychologi-

cal factors that I am not happier, or more successful, or better liked and things are getting worse' and so on and on."

The time seems to have come when a campaign of assurances by the psychiatric profession is needed to combat the surge of apprehension and misunderstanding that has swept over our people. This will produce more salutary effects than any further incitement to witch-hunting, of which our country has had its fill.

It would seem that those who have taken upon themselves the campaign for mental health, so-called, have a great responsibility upon their shoulders. If their aim, the reduction in mental disorders, is to be accomplished, it must be by other means than psychiatric warnings and admonitions.

The most concrete suggestion toward the goal of mental health is that of *child guidance*, before which there should be *parent guidance*. The suggestion is made that there should be parent guidance centers in which the parents could be taught how to produce discipline and teach social responsibility to their offspring. If children are taught self-restraint and conformation to social laws there would be made a vast contribution toward a more sane and substantial population.

*Military Surgeon, Vol. 101, p. 79; Colonel James M. Phalen, Secretary-Editor.*

## EPIDEMIC HEPATITIS

**I**NFECTION hepatitis and homologous serum jaundice are generally regarded as relatively mild diseases that are associated with a low mortality rate—about 0.2 per cent. Recovery is usually complete. Cases do occur, however, in which these infections are followed by a long-standing disability with a variety of symptoms referable to the liver or nervous system, or both.

Lucké described the pathological findings in the livers of 14 cases observed in the Army after apparent recovery from epidemic hepatitis. The livers had become available for examination as a result of

fatal accidents or unrelated diseases from one to fourteen months after the attack of hepatitis. From the study of these livers, Lucké concluded that complete restoration of the hepatic parenchyma usually occurs in nonfatal cases of hepatitis. Regeneration is usually complete provided that the destruction is acute and the injury is not continued and provided also that the destructive changes involve only the hepatic cells and not the framework or vessels; all this generally holds true in epidemic hepatitis. Lucké could find no evidence of permanent damage to the hepatic parenchyma.

In Denmark another malignant form of hepatitis has been observed in recent years. In the cases that were observed there, death occurred several months after the onset of acute hepatitis. Reports of cases of this type are now available from hospitals in Copenhagen. The malignant hepatitis observed in Denmark has occurred predominantly in women over 45 years of age and has a fatality rate of about 50 per cent. The duration of illness is usually from four to nine months, but both more acute and more protracted cases have been observed. Clinically the cases are characterized by jaundice, recurrent attacks of pain associated with fever and evidence of portal obstruction—that is, edema and ascites. There is persistent evidence of impaired liver function. The pathological findings are largely limited to the liver, in which there is widespread destruction of liver tissue and, in the relatively chronic cases, replacement by connective tissue.

The etiology of this form of hepatitis remains obscure. On epidemiologic grounds it is believed that this type has a different cause from that of the usual cases of epidemic hepatitis and that it is different from homologous serum jaundice. Indeed, the possibility is considered that it may not even be an infectious disease, although no alternative causes have been suggested. Similarly, no effective therapy has been found other than the usual dietary and supportive regimes used in hepatitis.

*The New England Journal of Medicine, Robert N. Nye, M.D., Managing Editor, Vol. 237, p. 35.*

# New Drugs

Information published in this department has been supplied by the manufacturers of the products described.

## PENICILLIN VAGINAL SUPPOSITORIES SCHENLEY

**PURPOSE:** An active preparation for the topical administration of penicillin to the vagina and cervix.

**COMPOSITION:** Each suppository contains 100,000 units of penicillin calcium in a base consisting essentially of cocoa butter.

**INDICATIONS FOR USE:** In the treatment of the lower genital tract, e.g., vaginitis, caused by, or associated with, penicillin-sensitive organisms, exclusive of the gonococcus.

**DOSAGE AND METHOD OF ADMINISTRATION:** In the treatment of infections, 1 or 2 Penicillin Vaginal Suppositories Schenley should be inserted into the vaginal canal morning and night until the infection is controlled and eradicated or until maximum therapeutic effect has been obtained. For prophylactic use in surgical procedures, 2 Penicillin Vaginal Suppositories Schenley should be inserted into the vaginal canal the night before and the morning of operation. During the postoperative period, 1 suppository should be inserted into the vaginal canal morning and night until all danger of infection has passed.

**CAUTIONS:** In considering the use of other local agents in conjunction with Penicillin Vaginal Suppositories Schenley, it should be remembered that the antibacterial properties of penicillin are adversely affected by oxidizing agents, acids, alkalies, primary alcohols, and heavy metals.

**HOW SUPPLIED:** Boxes of 6 and boxes of 12 suppositories.

**PRODUCER:** Schenley Laboratories, Inc., New York, N. Y.

## PENICILLIN G (POTASSIUM SALT), CRYSTALLINE, IN OIL AND WAX, 300,000 UNITS

**PURPOSE:** Antibiotic therapy.

**DESCRIPTION:** Sterile suspension of pure crystalline penicillin G (potassium salt) in peanut oil and beeswax containing 300,000 units of penicillin per cubic centimeter.

**INDICATIONS FOR USE:** Maintains effective blood levels of penicillin for approximately twenty-four hours. The oil and beeswax disappear from the injection

site in about a month without causing any untoward cellular reaction. For use in the treatment of gonococcal, pneumococcal, staphylococcal, and streptococcal infections.

**DOSAGE:** Intramuscular or subcutaneous injection in a daily dose of 3,000 units per pound of body weight up to 100 pounds. Between 100 and 200 pounds: 300,000 units. Over 200 pounds: 600,000 units.

**HOW SUPPLIED:** Sterile, disposable, 1 cc. cartridge syringe. \$.4.12.

**PRODUCER:** The Upjohn Company, Kalamazoo 99, Mich.

## PENICILLIN G, CRYSTALLINE (SODIUM SALT), BUFFERED, 100,000 UNITS

**PURPOSE:** Oral penicillin therapy.

**COMPOSITION:** Each tablet contains:

Penicillin G Crystalline (sodium salt) . . 100,000 units.

Calcium carbonate . . 4 grains.

**INDICATIONS FOR USE:** In treatment of infections caused by penicillin-susceptible organisms.

**DOSAGE:** One tablet every three hours.

**HOW SUPPLIED:** Desiccating vial of 12 tablets. \$.4.61.

**PRODUCER:** The Upjohn Company, Kalamazoo 99, Mich.

## ENFORBEC

**PURPOSE:** To provide therapeutic doses of the water-soluble vitamins.

**COMPOSITION:** Each Enforbec tablet contains:

Thiamine HCl 10 mg. Pyridoxine HCl 0.1 mg.

Riboflavin 5 mg. Calcium

Niacinamide 100 mg. pantothenate 10 mg.

Ascorbic acid 100 mg.

Together with natural B complex as derived from liver B fraction and yeast.

**DESCRIPTION:** Enforbec is presented in a hexagonal coated tablet of pleasing flavor and odor.

**DOSAGE:** Usual dose is 1 to 3 tablets daily, as determined by the physician.

**HOW SUPPLIED:** In bottles of 100.

**PRICE:** \$7.50 per bottle, full retail list.

**PRODUCER:** Harrower Laboratory, Inc., Glendale, Cal.

**'DELCO'S' PROTEIN—CARBOHYDRATE GRANULES**

**PURPOSE:** For treatment of protein nutritional deficiency states.

**COMPOSITION:** Each 100 gm. contains protein (derived from milk) 50 gm., and carbohydrate (derived from sugar and milk sugar) 30 gm.

**INDICATIONS FOR USE:** In treatment of protein nutritional deficiency states such as may occur in surgery, severe burns, infections, convalescence and chronic disease, peptic ulcer, ulcerative colitis, pregnancy and lactation, nutritional edema, and geriatrics. Delcos' Granules may be added to milk, pudding, junket, gelatin desserts, cereals, fruit juices, fresh fruits, ground meats, salads, waffle batter, ice cream or similar dishes.

**HOW SUPPLIED:** In 1-lb. and 5-lb. packages.

**PRODUCER:** Sharp & Dohme, Inc., Philadelphia, Pa.

**NEOCURTASAL**

**PURPOSE:** For use in a saltless diet.

**DESCRIPTION:** Odorless, white, crystalline, somewhat hygroscopic powder, consisting of potassium chloride, ammonium chloride, potassium formate, calcium formate, magnesium citrate, and starch.

**INDICATIONS FOR USE:** As a salt substitute in all diets in which sodium intake is restricted; e.g., cardiac and renal disease, hypertension, arteriosclerosis, certain complications of pregnancy, insomnia and other tension states, some types of dermatitis, and for the Gerson diet in tuberculosis. It should be used in approximately the same amount as table salt. It may be added to dough before baking and other foods before cooking, except when prolonged boiling is necessary. Then it should be added when the food is ready to be served.

**DOSAGE:** Used for seasoning in approximately the same amounts as table salt. If table salt is not completely withdrawn from the diet, it may be mixed with Neocurtasal in any desired proportions.

**HOW SUPPLIED:** Salt shaker of 2 oz. and bottle of 8 oz.

**PRODUCER:** Winthrop Chemical Company, Inc., New York, N. Y.

**SOLUTION TUBOCURARINE CHLORIDE**

**PURPOSE:** To provide muscular relaxation by an interruption of nervous impulses to skeletal muscle at the myoneural junction.

**COMPOSITION:** A sterile isotonic aqueous solution of d-tubocurarine chloride crystals standardized by weight to contain the equivalent of 2.7 mg. of the anhydrous salt or 3 mg. of the crystalline pentahydrate in 1 cc. of solution. When assayed by the rabbit "Head-Drop Crossover" test, each cc. is equivalent to 20 units of Intocostin. (Intocostin—Squibb purified extract of Curare in aqueous diluent).

**DESCRIPTION:** A clear, colorless solution.

**INDICATIONS FOR USE:** To secure muscular relaxation in surgery; to soften convulsions in shock treatment of mental disease; for the relief of spastic and athetoid states; for its relaxing effect in carrying out certain manipulative procedures; as a diagnostic agent in myasthenia gravis.

**DOSAGE AND ADMINISTRATION:** In anesthesia: 40-60 units (20 units for ether anesthesia) by intravenous route, followed by repeated smaller injections, if necessary. In shock to soften convulsions:  $\frac{1}{2}$  unit per pound of body weight, administered intravenously. Total initial dose 20 units less than computed on this basis as caution is advisable until individual reaction to drug is determined. In spastic and athetoid states: intramuscularly  $\frac{1}{2}$  to  $\frac{3}{4}$  unit per pound of body weight administered once, twice or thrice a day. In manipulative procedures: as in shock therapy or somewhat less. In diagnosis of myasthenia gravis:  $\frac{1}{15}$  to  $\frac{1}{5}$  of average adult shock therapy dose, intravenously.

Administered as a uniformly sustained injection over a period of from 30 to 60 seconds, if given by intravenous route. The intramuscular route may be used in patients with difficult veins but curarization develops much more slowly.

**CAUTIONS:** Overdosage results in temporary respiratory paralysis and should be avoided. In the event of accidental overdosage, prostigmine methyl sulfate is an effective antidote. 1 to 2 cc. of a 1:2000 dilution may be given intravenously and repeated if necessary. If the overdosage of curare is great, a large single dose of prostigmine may be dangerous because it may produce central nervous system depression; moreover, large doses of prostigmine and of curare may cause vasodepression. If respiratory paralysis should occur, prompt and effective artificial respiration with an assured free airway may be expected to carry patient through period of depression. Solution Tubocurarine Chloride is contraindicated in myasthenia gravis; although it serves as a diagnostic agent when administered in very small amounts (see dosage).

**HOW SUPPLIED:** A sterile isotonic aqueous solution supplied in 10 cc. rubber-capped vials, each cc. containing an amount of crystalline alkaloid equivalent to 20 units of Intocostin.

**LIST PRICE:** 10 cc. vial, \$2.92.

**PRODUCER:** E. R. Squibb & Sons, New York, N. Y.

## POSTGRADUATE COURSES

*Selected Postgraduate Continuation Courses for Practicing Physicians—September 1, 1947 to January 15, 1948*

### DIABETES

<i>Institution</i>	<i>Title of Course</i>	<i>Schedule of Course</i>	<i>Registration Fee and/or Tuition</i>
New England Deaconess Hospital, 15 Deaconess Road, Boston 15	Diabetes in Relation to General Medicine	5 days, full time, Oct. 6-11, 1947	20.00
New York Postgraduate Medical School, 303 E. 20th St., New York 3	Diabetes Mellitus, Nephritis and Hypertension	5 days, full time, Oct. 27-31, 1947	55.00

### ELECTROCARDIOGRAPHY

University of Michigan Medical School, 1313 E. Ann St., Ann Arbor	Electrocardiographic Diagnosis	1 week, full time, Nov. 10-15, 1947	50.00
Columbia University College of Physicians and Surgeons, 630 W. 168th St., New York 32	Intensive Course in Elementary Electrocardiography	1 week, full time, Sept. 29-Oct. 4, 1947	60.00
New York Postgraduate Medical School, 303 E. 20th St., New York 3	Electrocardiography	5 days, full time, Oct. 6-10, 1947	55.00

### ELECTROENCEPHALOGRAPHY

University of Illinois College of Medicine, 912 S. Wood St., Chicago	Electroencephalography for Doctors	2 months, full time, arranged—probably will be started Sept. 15, 1947	200.00
University of Texas Medical Branch, 912 Avenue B, Galveston	Electroencephalography	Arranged	Not Given

### ENDOCRINOLOGY

New York Academy of Medicine, 2 E. 103rd St., New York 29 At: Academy and Local Hospitals	Disorders of Metabolism and the Endocrine Glands	2 weeks, full time, October 6-17, 1947	5.00
New York Medical College, Flower and Fifth Ave. Hospitals, 20 E. 106th St., New York	Endocrinology	3 weeks, full time, Dec. 1947	150.00

### ENDOSCOPY

American Broncho-Esophagological Assn., 700 N. Michigan Ave., Chicago	Broncho-Esophagology and Laryngeal Surgery	2 weeks, full time, Sept. 15-28, 1947	150.00
University of Illinois College of Medicine, 912 S. Wood St., Chicago	Special Course in Broncho-Esophagology	2 weeks, full time, Nov. 1947 (Tentative)	150.00
New York University College of Medicine, 477 First Ave., New York 16 At: New York Eye and Ear Infirmary	Broncho-Esophagology <sup>1</sup>	12 days, full time, Nov. 1947	250.00
Temple University School of Medicine, 3400 N. Broad St., Philadelphia At: Temple University Hospital	Broncho-Esophagology	2 weeks, full time, arranged	250.00
University of Pennsylvania Graduate School of Medicine, 237 Medical Laboratories, Philadelphia 4 At: Affiliated Institutions	Broncho-Esophagology, Gastroscopy and Laryngeal Surgery	2 weeks, full time, arranged	250.00

### FRACTURES

New York Medical College, Flower and Fifth Avenue Hospitals, 20 E. 106th St., New York	Fractures and Allied Trauma	1 month, full time, Fall 1947	150.00
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## POSTGRADUATE COURSES

*Selected Postgraduate Continuation Courses for Practicing Physicians—September 1, 1947 to January 15, 1948*

### GASTROENTEROLOGY

<i>Institution</i>	<i>Title of Course</i>	<i>Schedule of Course</i>	<i>Registration Fee and/or Tuition</i>
University of Southern California, School of Medicine, 1200 N. State St., Los Angeles 33 At: Los Angeles County Hospital	Gastroenterology (Course 744)	12 months, full time, Sept. 15, 1947	1,000.00
Cook County Graduate School of Medi- cine, 427 S. Honore St., Chicago	Personal Course in Gastroscopy and Gastroenterology	2 weeks, full time, Sept. 22, 1947	200.00
Columbia University College of Physi- cians and Surgeons, 630 W. 168th St., New York 32 At: Mount Sinai Hospital	Surgery of the Gastro-Intestinal Tract	4 weeks, full time, Oct. 20-Nov. 14, 1947	150.00
	Surgery of the Gastro-Intestinal Tract	4 weeks, full time, Jan. 5-30, 1948	150.00
New York Medical College, Flower and Fifth Avenue Hospitals, 20 E. 106th St., New York	Gastroenterology	3 weeks, full time, Dec. 1947	100.00
New York Polyclinic Medical School and Hospital, 341-353 W. 50th St., New York	Clinical Gastroenterology	6 weeks, Oct. 1, 1947-Jan. 2, 1948	50.00
New York Postgraduate Medical School, 303 E. 20th St., New York 3	Gastroenterology	10 days, full time, Oct. 13-24, 1947	100.00
University of Oregon Medical School, Portland	Gastro-Intestinal Diseases	5 days, full time, Dec. 1-5, 1947	50.00
University of Pennsylvania Graduate School of Medicine, 237 Medical Laboratories, Philadelphia 4 At: Graduate Hospital	Clinical Gastroenterology <sup>1</sup>	16 weeks, full time, arranged	400.00

### HEMATOLOGY

University of Pennsylvania Graduate School of Medicine, 237 Medical Laboratories, Philadelphia 4 At: Bryn Mawr Hospital	Clinical and Laboratory Hematol- ogy	6 weeks, full time, Oct. 1, 1947	200.00
	Clinical and Laboratory Hematol- ogy	6 weeks, full time, Dec. 1, 1947	200.00

### MALIGNANT DISEASES

University of Kansas School of Medi- cine, 39th St. and Rainbow Blvd., Kansas City 3	Radiology and Cancer	3 days, Jan. 19-21, 1948	15.00
University of Oregon Medical School, 3181 S.W. Marquam Hill Road, Portland 1	Diagnosis and Treatment of Malignant Growths	4 days, full time, Sept. 22-25, 1947	25.00
Tennessee State Medical Association, Postgraduate Committee, 4 Univer- sity Center Bldg., Memphis. At: County seat towns and centers	Cancer Instruction, with Empha- sis Upon Diagnosis. For the General Medical Profession	10 weeks, 1947-1948	10.00

### MEDICINE, GENERAL

Medical College of Alabama, 620 S. 20th St., Birmingham 5 At: Birmingham At: Mobile	Medicine, Surgery, Gynecology and Obstetrics	3 days, full time, Oct. 1947 (Tentative)	None
	Medicine, Surgery, Gynecology and Obstetrics	3 days, full time, Oct. 1947 (Tentative)	None
California Medical Association, 450 Sutter St., San Francisco At: Leading cities in California	Postgraduate Program	All year	None



## POSTGRADUATE COURSES

*Selected Postgraduate Continuation Courses for Practicing Physicians—September 1, 1947 to January 15, 1948*

**MEDICINE—Continued**[illegible]

# POSTGRADUATE COURSES

Selected Postgraduate Continuation Courses for Practicing Physicians—September 1, 1947 to January 15, 1948

## MEDICINE—Continued

<i>Institution</i>	<i>Title of Course</i>	<i>Schedule of Course</i>	<i>Registration Fee and/or Tuition</i>
American Congress of Physical Medicine, 30 N. Michigan Ave., Chicago 2 At: Radisson Hotel, Minneapolis	Instruction Seminar	4 days, Sept. 2-5, 1947	1 lecture 2.00 10 lectures 15.00
Kansas City Southwest Clinical Soc., 630 Shukert Bldg., Kansas City, Mo.	Annual Fall Clinical Conference	4 days, full time, Oct. 6-9, 1947	15.00
Interstate Postgraduate Medical Assn., 16 N. Carroll St., Madison, Wis.	International Medical Assembly—A Postgraduate School	4 days, full time, Oct. 14-17, 1947	regis. 5.00
Omaha Mid-West Clinical Society, Omaha, Neb. At: Hotel Paxton	Fifteenth Annual Assembly	5 days, Oct. 27-31, 1947	regis. 5.00
University of Nebraska College of Medicine, 42nd St. & Dewey Ave., Omaha	General Refresher Course	44 hours per week, Sept., Oct., Nov., Dec., 1947	25.00
Columbia University College of Physicians and Surgeons, 630 W. 168th St., New York 32 At: Mount Sinai Hospital	Symposium of Internal Medicine	8 weeks, full time, Oct. 6-Dec. 6, 1947	350.00
American College of Surgeons, 40 E. Erie St., Chicago At: New York	Thirty-Third Clinical Congress	5 days, Sept. 8-12, 1947	5.00 <sup>4</sup> Non-members 10.00
Cornell University Medical College, 1300 York Ave., New York 27 At: Bellevue Hospital	Graduate Course in Internal Medicine	6 months, full time continuously, 1st of each month	6 mn. 300.00 2 wks. 50.00
New York Polyclinic Medical School and Hospital, 341-353 W. 50th St., New York	Course for General Practitioners Course for General Practitioners	6 weeks, arranged 3 months, arranged	100.00 <sup>3</sup> 200.00 <sup>3</sup>
New York Medical College, Flower and Fifth Ave. Hospitals, 20 E. 106th St., New York	Internal Medicine	1 month, full time, monthly	150.00
New York Postgraduate Medical School, 303 E. 20th St., New York 3	Review of Internal Medicine Seminar in Internal Medicine	13 weeks, full time, Sept. 23-Dec. 13, 1947 2 months, full time, Jan. 5-Feb. 27, 1947	400.00 12 weeks 150.00 8 weeks 100.00 4 weeks 50.00
New York University College of Medicine, 477 First Ave., New York 16 At: Lenox Hill Hospital	General Review for General Practitioners	8 weeks, full time, Fall 1947	Vets. 125.00 non-Vets. 150.00
Duke University School of Medicine, Durham, N. C.	General Medicine Medicine	1-2 weeks or longer, full time, arranged 3 months or longer, full time, arranged	per mo. 50.00 per mo. 50.00
American College of Surgeons, 40 E. Erie St., Chicago At: Cleveland Public Auditorium, Cleveland, Ohio	Thirty-Second Clinical Congress	5 days, December, 16-20, 1947	Fellows None Non-members 10.00

# POSTGRADUATE COURSES

*Selected Postgraduate Continuation Courses for Practicing Physicians—September 1, 1947 to January 15, 1948*

## MEDICINE—Continued

<i>Institution</i>	<i>Title of Course</i>	<i>Schedule of Course</i>	<i>Registration Fee and/or Tuition</i>
Oklahoma City Clinical Society, 512 Medical Arts Bldg., Oklahoma City At: Biltmore Hotel	Oklahoma City Clinical Society Annual Fall Clinical Conference	4 days, Oct. 27-30, 1947	15.00 <sup>5</sup>
University of Pennsylvania Graduate School of Medicine, 237 Medical Laboratories, Philadelphia 4 At: Graduate Hospital	Segmental Neuralgias, Relief by Regional Anesthetics	3 weeks full time, Oct. 1947-May 1948	monthly 200.00
Piedmont Postgraduate Clinical Assembly, 209 N. Main St., Anderson, S.C.	Piedmont Postgraduate Clinical Assembly	1 day (including night) Sept. 15, 1947	15.00
Alumni Association, Medical College of the State of South Carolina, 16 Lucas St., Charleston	Alumni Postgraduate Seminar	3 days, full time, Nov. 4-6, 1947	15.00
Vanderbilt University School of Medicine, Nashville 4, Tennessee	Medicine	1-3 months, Oct. 1947	3 mos. 166.66
University of Vermont College of Medicine, Pearl St., College Park, Burlington	General Practice; Internal Medicine; Surgery	1-9 months, 1st of any month to Jan. 1948	per yr. 500.00 or pro rated
Washington State Medical Association, Seattle	Internal Medicine	4 weeks, Sept. 1-27, 1947	Not given
University of Wisconsin Medical School, 418 N. Randall St., Madison At: Wisconsin General Hospital	Course for Specialists in Internal Medicine <sup>1</sup>	2-6 months, arranged	per mo. 100.00
	Observation Course in Medical and Clinical Subjects	1-5 months, arranged	per mo. 100.00

## NEUROLOGY AND PSYCHIATRY

University of California Medical School, San Francisco 22	Postgraduate Course in Psychiatry	12 weeks, full time, Sept. 8-Nov. 28, 1947	200.00
	Psychiatry and Neurology	3 months, Sept. 1947	200.00
American College of Physicians, 4200 Pine St., Philadelphia At: Colorado Psychopathic Hospital, Denver	Psychosomatic Medicine	2 weeks, Sept. 15-27, 1947	Not given
Catholic University of America Dept. of Psychology and Psychiatry, Washington, D. C. At: St. Elizabeth's Hospital	Psychiatric Conferences	2 semesters, Sept. 1947	per yr. 20.00
	Group Psychotherapy	2 semesters, Sept. 1947	per yr. 20.00
	Individual Psychotherapy	2 semesters, Sept. 1947	per yr. 20.00
Catholic University of America Dept. of Psychology and Psychiatry, Washington, D. C.	Psychiatry-Case Seminar in Psychotherapy	2 semesters, Sept. 1947	per sem. 20.00
	Introduction to Psychiatry	1 semester, Sept. 1947	per sem. 10.00
	Clinical Psychiatry	2 semesters, Sept. 1947	per sem. 20.00
	Psychopathology	2 semesters, Sept. 1947	per sem. 10.00
	Neurology, Neuropathology and Neurooentgenology	2 semesters, Sept. 1947	per sem. 20.00
	Seminar in Clinical Psychology and Psychotherapy	1 semester, Sept. 1947	20.00

## POSTGRADUATE COURSES

*Selected Postgraduate Continuation Courses for Practicing Physicians—September 1, 1947 to January 15, 1948*

### NEUROLOGY AND PSYCHIATRY—Continued

<i>Institution</i>	<i>Title of Course</i>	<i>Schedule of Course</i>	<i>Registration Fee and/or Tuition</i>
Columbia University College of Physicians and Surgeons, 630 W. 168th St., New York 32 At: Columbia Presbyterian Medical Center	Symposium on Neurology and Psychiatry Advanced Neurology Advanced Neurology Clinical Electroencephalography and Electromyography Recent Advance in Neurology and Psychiatry	9 weeks, full time, October 6-Dec. 12, 1947 13 weeks, full time Jan. 5-April 2, 1948 13 weeks, full time Oct. 6-Dec. 30, 1947 3 months, full time, between Oct. 1, 1947 and Mar. 31, 1948 5 days, full time, Dec. 8-12, 1947	250.00 150.00 150.00 150.00 60.00
At: Mount Sinai Hospital			
New York Medical College, Flower and Fifth Avenue Hospitals, 20 E. 106th St., New York	Neurology 3 Year Comprehensive Course in Psychoanalysis	1 month, full time arranged 3 years Oct. 1947	200.00 30.00
New York State Department of Health, 76 State St., Albany 7 At: School for Corrective Motor Education, East Hampton, L. I. At: Neurological Institute, New York	Special Phases in Diagnosis, Evaluation, Treatment and Training of Cerebral Palsy Patients Special Phases in Diagnosis Evaluation, Treatment and Training of Cerebral Palsy Patients Special Phases in Diagnosis Evaluation, Treatment and Training of Cerebral Palsy Patients	Minimum 2 weeks, arranged Minimum 2 weeks, arranged Minimum 2 weeks, arranged	None? None? None?
At: Neuro-Psychologic Rehabilitation Institute, Philadelphia, Pa.			
New York Postgraduate Medical School, 303 E. 20th St., New York 3	Neurological and Psychiatric Diagnosis and Treatment in General Practice	2 weeks, full time, Dec. 8-20, 1947	100.00
New York University College of Medicine, 477 First Ave., New York 16 At: Bellevue Hospital	Psychiatry and Neurology	8 weeks, full time, Sept. 15, 1947	250.00
Duke University School of Medicine, Durham, N. C.	Neuropsychiatry Neurosurgery	3 months or longer, full time, arranged 3 months or longer, full time, arranged	per mn. 50.00 per mo. 50.00
University of Pennsylvania Graduate School of Medicine, 237 Medical Laboratories, Philadelphia 4 At: Affiliated Institutions	Neurology, Psychiatry (Basic Studies) Clinicobiologic Neurology and Psychiatry	8 months, full time, Oct. 1947-May 1948 10 weeks, full time	800.00 300.00

### NEUROSURGERY

University of Wisconsin Medical School, 418 N. Randall St., Madison	Neurosurgery for Specialists <sup>1</sup>	2-6 months, arranged	per mo. 100.00
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### OBSTETRICS AND GYNECOLOGY

Alabama State Health Dept. and Jefferson County Health Dept., Birmingham	Refresher Course in Obstetrics and Gynecology	3 days, September 1947	15.00
At: Slossfield Maternity Center	Institute of Negro Physicians (Obstetrics)	3 days, full time, Sept. 1947	15.00
University of Southern California School of Medicine, 1200 N. State St., Los Angeles 33 At: Los Angeles County Hospital	Obstetrics and Gynecology (Course 753)	2 weeks, full time, Oct. 1947	100.00

## POSTGRADUATE COURSES

*Selected Postgraduate Continuation Courses for Practicing Physicians—September 1, 1947 to January 15, 1948*

### OBSTETRICS AND GYNECOLOGY—Continued

<i>Institution</i>	<i>Title of Course</i>	<i>Schedule of Course</i>	<i>Registration Fee and/or Tuition</i>
University of California Medical School, San Francisco 22 At: University of California Medical Center	Obstetrics and Gynecology	5 days, full time, Sept. 1-5, 1947	35.00
Cook County Graduate School of Medicine, 427 S. Honore St., Chicago	Obstetrics Operative and Office Gynecology	2 weeks, full time, Sept. 8, 1947 2 weeks, full time, Sept. 22, 1947	150.00 150.00
University of Maryland School of Medicine, Lombard and Greene St., Baltimore	Review of Gynecology, Oncology and Female Urology Review Obstetrics and Gynecology	10 weeks, full time, arranged 6 weeks, full time, arranged	125.00 150.00
Columbia University College of Physicians and Surgeons, 630 W. 168th St., New York 32	Observation Course in Obstetrics	1 month, full time, 1st of every month	100.00
New York Polyclinic Medical School and Hospital, 341-353 W. 50th St., New York	Combined Obstetrics and Gynecology	2 months, full time, Oct. 1, 1947	250.00
New York Postgraduate Medical School, 303 E. 20th St., New York 3	Seminar in Gynecology	2 months, full time, Oct. 1-Nov. 29, 1947	300.00
Duke University School of Medicine, Durham, N. C.	Obstetrics and Gynecology	3 months or longer, full time, arranged	per mo. 50.00
University of Oregon Med. School, 3181 S.W. Marquam Hill Road, Portland 1	Gynecology	5 days, full time, Oct. 27-31, 1947	50.00
Hahnemann Medical College and Hospital of Philadelphia, 235 N. 15th St., Philadelphia	Obstetrics	2 months, full time, July 1, 1947-Jan. 15, 1948	200.00

### OPHTHALMOLOGY

University of Southern California School of Medicine, 1200 N. State St., Los Angeles At: Los Angeles County Hospital	Basic Ophthalmology (Course 852)	4 months, full time, Oct. 1947	600.00
University of California Medical School, San Francisco 22 At: Medical Center	Postgraduate Course in Ophthalmology	5 days, full time, Sept. 15-19, 1947	60.00
Children's Memorial Hospital, 707 Fullerton Ave., Chicago 14	Postgraduate conference in Neuromuscular Anomalies of the Eyes	1 week, second week in November, 1947	50.00
New York Postgraduate Medical School, 303 E. 20th St., New York 3	Anomalies of the Ocular Muscles (Restricted to Ophthalmologists) <sup>1</sup>	5 days, full time, Oct. 27-31, 1947	75.00
	Differential Diagnosis with the Slit Lamp (Restricted to Ophthalmologists)	5 days, part time, Nov. 10-14, 1947	50.00
	Motor Anomalies of the Eye (Restricted to Ophthalmologists) <sup>1</sup>	6 days, full time, Oct. 20-25, 1947	100.00
New York Postgraduate Medical School, 303 E. 20th St., New York 3	Surgery of the Eye <sup>1</sup> (Restricted to Ophthalmologists)	6 days, full time, Nov. 3-8, 1947	100.00

## POSTGRADUATE COURSES

*Selected Postgraduate Continuation Courses for Practicing Physicians—September 1, 1947 to January 15, 1948*

### OPHTHALMOLOGY—Continued

<i>Institution</i>	<i>Title of Course</i>	<i>Schedule of Course</i>	<i>Registration Fee and/or Tuition</i>
New York University, 477 First Ave., New York 16 At: New York Eye and Ear Infirmary	Allergy of the Eyes and Upper Respiratory Tract <sup>1</sup>	12 lectures and 12 clinic sessions, arranged	100.00
University of Rochester School of Medicine and Dentistry, Crittenden Blvd., Rochester, N. Y.	Ophthalmology	3½ days, full time, July 28-31, 1947	40.00
Duke University School of Medicine, Durham, N. C.	Ophthalmology	3 months or longer, full time, arranged	per mo. 50.00
Cleveland Clinic, Euclid Ave. at E. 93rd St., Cleveland 6	Diseases of Eye, Ear, Nose and Throat	3 days, first week in Dec. 1947	Not given
Virginia Society of Ophthalmology & Otolaryngology, University Station, Charlottesville At: Medical College of Virginia, Richmond	Postgraduate Course in Ophthalmology and Otolaryngology	4 days, Dec. 1947	full course 25.00 part 15.00

### ORTHOPEDIC SURGERY

State University of Iowa School of Medicine, Iowa City	Orthopedic Surgery	10 months, full time, Sept. 1, 1947-July 1, 1948	300.00
New York Postgraduate Medical School, 303 E. 20th St., New York 3	Orthopedics in General Practice Seminar in Orthopedic Surgery <sup>1</sup> (Restricted to Surgeons)	6 days, full time, Nov. 3-8, 1947 10 days, full time, Jan. 5-16, 1947	60.00 125.00
Duke University School of Medicine, Durham, N. C.	Orthopedic Surgery	8 months or longer, full time, arranged	per mo. 50.00

### OTOLARYNGOLOGY

Columbia University College of Physicians and Surgeons, 630 W. 168th St., New York	Otolaryngology	3-6 months, full time, first day of any month	150.00
New York Postgraduate Medical School, 303 E. 20th St., New York 3	Symposium on Otolaryngology (Restricted to Otolaryngologists) <sup>1</sup>	2 weeks, full time, Nov. 10-22, 1947	150.00
Duke University School of Medicine, Durham, N. C.	Otolaryngology	3 months or longer, full time, arranged	per mo. 50.00
Virginia Society of Ophthalmology and Otolaryngology University Station, Charlottesville At: Medical College of Virginia, Richmond	Postgraduate Course in Ophthalmology and Otolaryngology	4 days, Dec. 1947	full course 25.00 part 15.00

### OTOLOGY

New York Polyclinic Medical School and Hospital, 341-353 W. 50th St., New York	Advanced Otolaryngology	Arranged	250.00
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### OTORHINOLARYNGOLOGY

University of California Medical School, San Francisco 22 At: Medical Center	Postgraduate Course in Otorhinolaryngology	5 days, full time, Sept. 8-12, 1947	60.00
Cleveland Clinic, Euclid Ave. at E. 93rd St., Cleveland 6, Ohio	Diseases of Eye, Ear, Nose and Throat Course	3 days, first week in Dec. 1947	Not given

# POSTGRADUATE COURSES

*Selected Postgraduate Continuation Courses for Practicing Physicians—September 1, 1947 to January 15, 1948*

## PATHOLOGY

<i>Institution</i>	<i>Title of Course</i>	<i>Schedule of Course</i>	<i>Registration Fee and/or Tuition</i>
Cook County Graduate School of Medicine, 427 S. Honore St., Chicago	1 Month Course Surgical Pathology	1 month, full time, every month	250.00
U-Maryland School of Medicine, Lombard and Greene Sts., Baltimore	Neuropathology <sup>1</sup>	6 months, full time, arranged	210.00
Duke University School of Medicine, Durham, N. C.	Pathology	3 months or longer, full time, arranged	per mo. 50.00
	Pathological Research	3 months or longer, full time, arranged	per mo. 50.00
	Gross and Microscopic Conferences on Surgical Pathology	3 months or longer, full time, arranged	per mo. 50.00
	Systematic Review of General and Surgical Pathology	3 months or longer, full time, arranged	per mo. 50.00
	Staff Appointment in Pathology	3 months or longer, full time, arranged	per mo. 50.00
University of Texas Medical Branch, 912 Ave. B, Galveston	Surgical Pathology	Arranged	Not given

## PEDIATRICS

Cook County Graduate School of Medicine, 427 S. Honore St., Chicago	Clinical Course in Pediatrics	2 weeks or 1 month, full time, every two weeks	2 wks. 60.00 1 mo. 100.00
University of Minnesota Medical School, Minneapolis 14	Pediatrics	6 weeks, full time, arranged	Arranged
New York Medical College, Flower and Fifth Ave. Hospitals, 20 E. 106th St., New York	Clinical Pediatrics	1-9 months, all year	1 mo. 150.00 3 mo. 250.00 6 mo. 450.00 9 mo. 650.00
			Not given
			4 weeks, part time, arranged
			5 days, full time, Oct. 6-10, 1947
			5 days, full time, Dec. 8-12, 1947
New York Postgraduate Medical School, 303 E. 20th St., New York 3	Allergy for Pediatricians (Restricted to Pediatricians) <sup>1</sup>	5 days, full time, Oct. 6-10, 1947	75.00
	Cardiology for Pediatricians (Restricted to Pediatricians) <sup>1</sup>	5 days, full time, Dec. 8-12, 1947	75.00
	Clinical Pediatrics	4 weeks, full time, Oct. 13-Nov. 8, 1947	150.00
	Clinical Pediatrics	4 weeks, full time, Jan. 5-31, 1948	150.00
	Dermatology for Pediatricians (Restricted to Pediatricians) <sup>1</sup>	5 days, full time, Sept. 29-Oct. 3, 1947	75.00
	Neurology and Psychiatry for Pediatricians (Restricted to Pediatricians) <sup>1</sup>	2 weeks, full time, Oct. 13-25, 1947	100.00
	Practical Clinical Pediatrics	4 weeks, full time, Nov. 10-Dec. 5, 1947	125.00
Duke University School of Medicine, Durham, N. C.	Pediatrics	3 months or longer, full time, arranged	per mo. 50.00
University of Cincinnati College of Medicine, Eden and Bethesda Aves., Cincinnati, Ohio	Pediatrics	3-4 months, Cont.	per mo. 30.00
Oregon State Medical Society and Oregon State Board of Health, Portland	Refresher Course in Pediatrics	Arranged, Fall 1947 (Tentative)	Not given

## POSTGRADUATE COURSES

*Selected Postgraduate Continuation Courses for Practicing Physicians—September 1, 1947 to January 15, 1948*

### PEDIATRICS—Continued

<i>Institution</i>	<i>Title of Course</i>	<i>Schedule of Course</i>	<i>Registration Fee and/or Tuition</i>
University of Texas Medical Branch, 912 Ave. B, Galveston	Pediatrics	1 week, Oct. 1947	25.00
University of Wisconsin Medical School, 418 N. Randall St., Madison	Course in Pediatrics for Special- ists	2-6 months, arranged	per mo. 100.00

### POLIOMYELITIS

Georgia Warm Springs Foundation, Warm Springs At: Jewish Hospital	Poliomyelitis	2 weeks, first Monday in Oct. 1947	Not given
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### PROCTOLOGY

New York Polyclinic Medical School and Hospital, 341-353 W. 50th St., New York	Proctology and Gastroenterology (clinical)	6 weeks, Oct. 1, 1947-Jan. 2, 1948	100.00
	Combined Proctology and Gas- troenterology (clinical) and operative (cadaver) Proctology.	6 weeks, Oct. 1, 1947-Jan. 2, 1948	200.00

### RADIOLOGY

Cook County Graduate School of Medicine, 427 S. Honore St., Chi- cago	Clinical Roentgenology	2 weeks, full time, third Mon- day of every month	70.00
	Lecture and Clinical Roentgenol- ogy	2 weeks, full time, first Mon- day of every month	125.00
	X-ray Therapy	2 weeks or 1 month, full time	2 wks. 100.00 1 mo. 200.00
University of Kansas School of Medi- cine, 39th St. and Rainbow Blvd., Kansas City	Radiology and Cancer	3 days, Jan. 19-21, 1948	15.00
Columbia University College of Physi- cians and Surgeons, 630 W. 168th St., New York 32 At: Affiliated Hospitals	Symposium on Diagnostic Radiol- ogy <sup>1</sup>	10 weeks, full time, Sept. 29- Dec. 5, 1947	250.00
New York Polyclinic Medical School and Hospital, 341-353 W. 50th St., New York	Radiology	8 months, Oct. 1, 1947-Jan. 2, 1948	300.00
University of Oregon Medical School, 3181 S.W. Marquam Hill Road, Portland 1	Radiology	5 days, full time, Nov. 10-14, 1947	50.00

### THERAPY

Columbia University College of Physi- cians and Surgeons, 630 W. 168th St., New York 32 At: Columbia Presbyterian Medical Center	Physiologic Therapy in Respira- tory Diseases	6 days, full time, Jan. 26-31, 1948	40.00
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### UROLOGY

James Buchanan Brady Foundation of The New York Hospital, 525 E. 68th St., New York	Postgraduate Course in Urology	6 months, full time, Jan.-July, 1948	500.00 <sup>2</sup>
New York Postgraduate Medical School, 303 E. 20th St., New York 3	Advanced Course in Urology (Restricted to Urologists)	2 months, full time, Oct. 1, 1947	300.00



## POSTGRADUATE COURSES

*Selected Postgraduate Continuation Courses for Practicing Physicians—September 1, 1947 to January 15, 1948*

### UROLOGY—Continued

<i>Institution</i>	<i>Title of Course</i>	<i>Schedule of Course</i>	<i>Registration Fee and/or Tuition</i>
New York Polyclinic Medical School and Hospital, 341-353 W. 50th St., New York	Urology and Allied Subjects	8 months, full time, Oct. 1, 1947	800.00

### VENEREAL DISEASES

U. S. Public Health Service and Arkansas State Board of Health, Hot Springs National Park, Ark.	Ninth Postgraduate Course in The Management and Control of the Venereal Diseases	3 weeks, full time, fall 1947	None
Columbia University College of Physicians and Surgeons, 630 W. 168th St., New York, 32	Venereal and Skin Diseases	6 days, full time, Dec. 1-6, 1947	30.00

- |                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                            |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ol style="list-style-type: none"> <li>1. Specialists only.</li> <li>2. Stipends up to a maximum of \$250.00 per month are available if certain qualifications can be met.</li> <li>3. Half fee to physicians in service.</li> <li>4. Fellows and Jr. candidates.</li> </ol> | <ol style="list-style-type: none"> <li>5. Including dinners and luncheons.</li> <li>6. No extra charge for longer stay.</li> <li>7. Stipend (including travel) and tuition fee (when there is such) paid for by the department.</li> </ol> |
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# Medicine Makes the News

## POLIOMYELITIS CONFERENCE

MARKING the twentieth anniversary of the founding of Georgia Warm Springs, a three-day clinical conference on diagnosis and treatment of poliomyelitis will be held at Warm Springs, Georgia, on September 15, 16, and 17.

The clinical conference will be led by approximately twenty of the nation's authorities in the fields of neurology, pathology, pediatrics, orthopedics, physical medicine, and internal medicine who will present papers reviewing the advances in poliomyelitis knowledge in these fields.

The papers and discussions will constitute a new book on diagnosis and treatment of the disease

for publication in 1948. Clinical demonstrations of modern treatment methods will be given by the medical staff of the Warm Springs Foundation.

Physicians interested in attending this conference should make inquiries to the Georgia Warm Springs Foundation, 120 Broadway, New York 5, N. Y. Complete program of the meeting will be available on request.

## A.M.A. ART SHOW

With some 1000 pieces on display, the Ninth Annual Exhibition of the American Physicians' Art Association, held during the A.M.A. Centen-

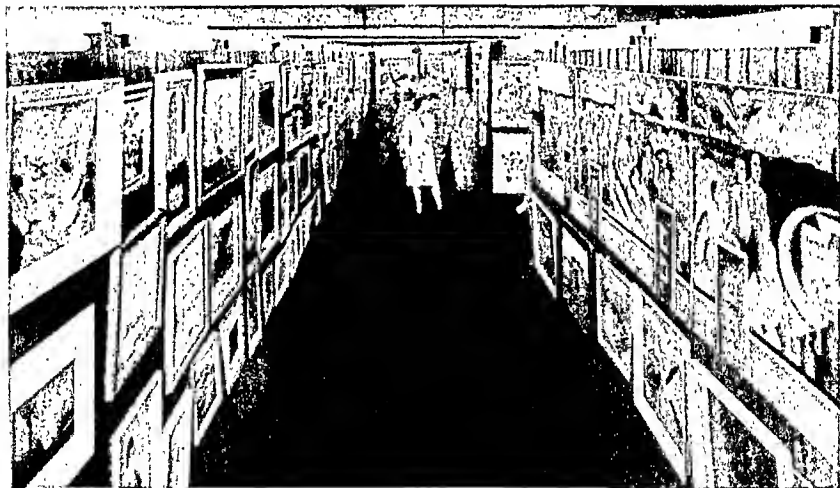
nial Meeting at Atlantic City, June 9 to 13, was the largest show yet held by the group.

The work shown—oils, water colors, charcoal sketches, etchings, photographs, sculptures, ceramics, needlework, metalwork—filled 6000 square feet of hanging surface and more than 5300 feet of floor space. A total of 1,104 entries in the various media was shown in the regular competition, in addition to works which were entered in a special division on the theme of "Courage and Devotion." Many of the latter were in the call-of-duty category and included recent works on World War II.

The art exhibition was under the direction of Mr. A. L. Rose, Mead Johnson Company, which sponsors the exhibit on a non-commercial basis and

arranged for its transportation from Philadelphia where judges selected winners a week before the show. Cups, medals, and certificates were awarded the winning entries which came in from all over the United States, Canada, Hawaii, Costa Rica, Alaska, and Mexico.

Officers of the American Physicians' Art Association are: President, Dr. G. Harvey Agnew; first vice president, Dr. Chelsea Eaton; second vice president, Dr. Anthony Bassler; third vice president, Dr. Somers H. Sturgis; secretary, Dr. F. H. Redewill; assistant secretary, Dr. F. H. Redewill, Jr., and treasurer, Dr. Paul Wedgewood. Dr. Robert F. Ridpath served as general chairman of the 1947 exhibition.



### PHYSICIANS' ART SHOW SETS RECORD

General view of the Ninth Annual Exhibition of the American Physicians' Art Association held in conjunction with the Centennial session of the A.M.A. at Atlantic City, June 9 to 13. This exhibit, which has established itself as a feature event of the annual A.M.A. meetings, is sponsored by Mead Johnson & Company of Evansville, Indiana.

# After Hours

## ON WRITING AND OTHER ARTS

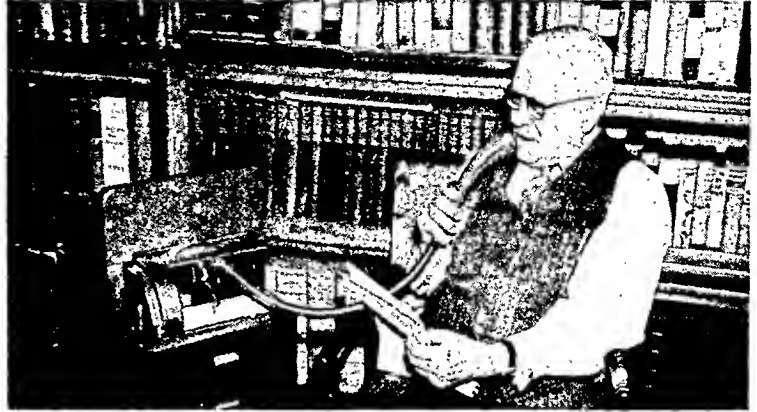
### PHYSICIAN AND COLUMNIST

Dr. William E. Ground, of Superior, Wisconsin, who has been in continuous active medical practice for more than sixty-six years, has set a record few other physicians in the United States can match. There are older physicians still in practice, but probably none have put in as many years of active practice.

Dr. Ground received his M.D. degree in 1881 at the age of 20, and after spending more than half a dozen years in hospitals in the east and abroad, studying post-graduate work in gynecology and general surgery, he decided to select a permanent location. Not liking heat or large cities, favoring water and wanting to be near it, he looked at the map and decided to settle at the Head of the Great Lakes.

Dr. Ground has written more than a hundred medical and scientific papers and, for many years, has contributed a column every month or so to the Superior, Wisconsin, daily newspaper, *The Evening Telegram*. The subjects of his columns vary with the thoughts and problems of the day, and may be medical, political, social, or philosophical in nature.

Dr. Ground believes that in addition to first class scientific and clinical training, a physician requires a general cultural background if he is to retain a broad outlook on life and an inexhaustible fund of idealism if he is to give his patients the sympathy and courage which they demand of the



W. E. GROUND, M.D.

Healing Art. Perhaps a knowledge of the great men of medicine and the spirit that animated them will give the physician something of both, he added.

\* \* \*

### MILITARY MEDICO

A doctor in literature is Colonel James M. Phalen, who has been editor of *The Military Surgeon* since 1940. Spending most of his adult life in the Army Medical Corps, he was, until his retirement, known as a specialist in medical field service and administration. Many years ago Colonel Phalen planned to do editorial work and he fits into his present niche perfectly. He combines a deep analytical ability with subtle humor, making his editorials for the journal widely read. His views are bitterly attacked and warmly defended, but they are never ignored.

Those people for whom Ireland has always had an attraction, and who hope some day to visit that country, will probably enjoy such a trip more if they have read Colonel Phalen's book, "I Follow Mr. Thackeray." This work, more or less, describes the same tour made by the British novelist many years earlier. Published in 1946, it is an objective discourse upon the experiences and impressions of a summer sojourn in Ireland during 1939, a year of troubled peace.

Another book, written a few years ago by Dr. Phalen, is "Sinissippi, A Valley Under a Spell." This is a history book of an unusual sort. It is a history of Wisconsin, which tells not so much about the state's development since the coming of the white man as it does about the geological history of the land itself, and the changes in the character and population of the state's Indian inhabitants. The passage on the Colonel's own youth in Troy Valley is apt to re-

mind the reader of his own younger days. The author writes enthusiastically about the charm of the historic Rock River country and its people, of their adventures and their achievements.

\* \* \*

#### THE COLLECTING SPIRIT

The collecting spirit is quite common among physicians and in Cleveland, one of the most enthusiastic is Dr. Warren C. Fargo who started his collection of bells about 20 years ago when he found three small brass (English) bells in Montreal.

Since then, Dr. Fargo has acquired bells from Persia, India, Guam, Belgium, Italy, England and Germany. His bells are all small, all metal—brass, copper, iron, pewter—and none more than six inches in height. Doctor Fargo's bells are both old and new, some quite primitive and many are very beautifully hand made.

"The bells are delightful and intriguing," says Doctor Fargo, "and seem to interest both old and young. I take pleasure in the different tones and the fact that they can be found usually in almost any part of the world fits in with my other hobbies of globe-trotting and taking color movies."

Dr. Paul G. Moore, also of Cleveland, has a collection of shaving mugs and Toby jugs. While driving through Pennsylvania with Mrs. Moore, who was collecting colored glass, Doctor Moore became interested in collecting. He now has 60 shaving mugs, some bearing fraternal and industrial emblems.

Doctor Moore has several jugs or pitchers, duplicates of which may be found in the National Museum at Toronto. Several of his

jugs were made in Sauergemines on the border of Germany.

Doctor Moore also has a number of old deep-blue whisky glasses, made some years ago in Zanesville, Ohio; cheaters — glasses that appeared to hold four ounces of whisky and only held two. Some of his whisky glasses are of cut glass, some with 16 panels on the side and a flower in the bottom sealed in below with gold leaf.

\* \* \*

#### MORE HOBBIES



Head of Helen-Marie Farnacy, modeled by her father, Dr. N. Lester Farnacy.

\* \* \*

A Cleveland physician whose hobbies are in the fields of fine arts is Dr. N. Lester Farnacy. He has some splendid specimens of craftsmanship in metals. He first models in clay and then has them cast in bronze. He has done pencil sketches and water colors—landscape scenes and portraits of his daughters, some of which have been exhibited. Doctor Farnacy also carves in wood. In this medium he has used various woods and likes black wal-

nut, peach wood and Philippine mahogany.

One doctor who is outstanding in that he has a combination of hobbies is Dr. Henry J. John of Cleveland. His many hobbies are, in the main, connected with his interest in keeping alive the great cultural heritage of Czechoslovakia. He has done Czech translations of *Belles Lettres* and collected some 1,000 contemporary Czech etchings which may be the largest collection of its kind in the world. Doctor John's library has some thousands of books on all subjects but with a special interest in art. Among them are some rare and first editions of Czech, French, German and modern contemporary European literature.

In 1929 Doctor John gave full rein to one of his special interests by establishing Camp Ho Mita Koda (Sioux Indian meaning "Welcome, my friend") thus providing a vacation place and medical care for 50-60 diabetic children. Doctor John says of his camp, "It is a place where many children meet, for the first time, other children in the same boat and can see what these others have accomplished."

#### PHYSICIAN-POET

Why prisoners write poetry is one of the mysteries of literature. One physician who wrote poetry during the three years he was a captive at Bilibid Prison in Manila, was an American prisoner-of-war, Major Charles Brown of the U. S. Army Medical Corps. His book, "Bars From Bilibid Prison," published in March 1947, by the Naylor Company of San Antonio, Texas, expresses the thoughts and

emotions of a man who dreamed of a day when he would be released.

General Jonathan M. Wainwright, in his foreword to Dr. Brown's book, says: "Major Brown should be complimented for his ability to lift from his heart these memories and put them in a narrative and verse."



CHARLES BROWN, M.D.

These poems were written while the actual experiences upon which they are based were being endured. Dr. Brown begins each chapter with a description in prose of the treatment of Allied prisoners-of-war by the Japanese. "I first saw the ancient gate of the old Spanish prison," writes Dr. Brown, "in a downpour of rain, as a prisoner of the Japanese after the fall of Bataan. The jungle had been horrible enough, but at least, it had been alive. Bilibid Prison was dead! The odor of death clung to it like the fungus on the walls." There are tragedy and pathos in Dr. Brown's verses, some irony and satire, but no bitterness, and most remarkable of all, even some humor.

The following are just two of the poems in his book:

#### PRISON POT

The prison is a cauldron  
With a purging flame that burns  
Some men into their ashes,  
And they never will return.

But there are others in the kettle  
Who, the hotter there the flame,  
The tougher gets their mettle,  
And they return from it the same.

#### MY SWEETHEART

My sweetheart is Malaria,  
And I met her in Bataan;  
I'm just one love of her many loves,  
But still her favorite man.

Our love began with a tropic moon,  
Where the river meets the sea;  
And she spends her charms in other  
arms,  
But always returns to me.

Our love is like all other loves,  
She leaves me now and then;  
But my fever burns and love returns,  
To embrace me once again.

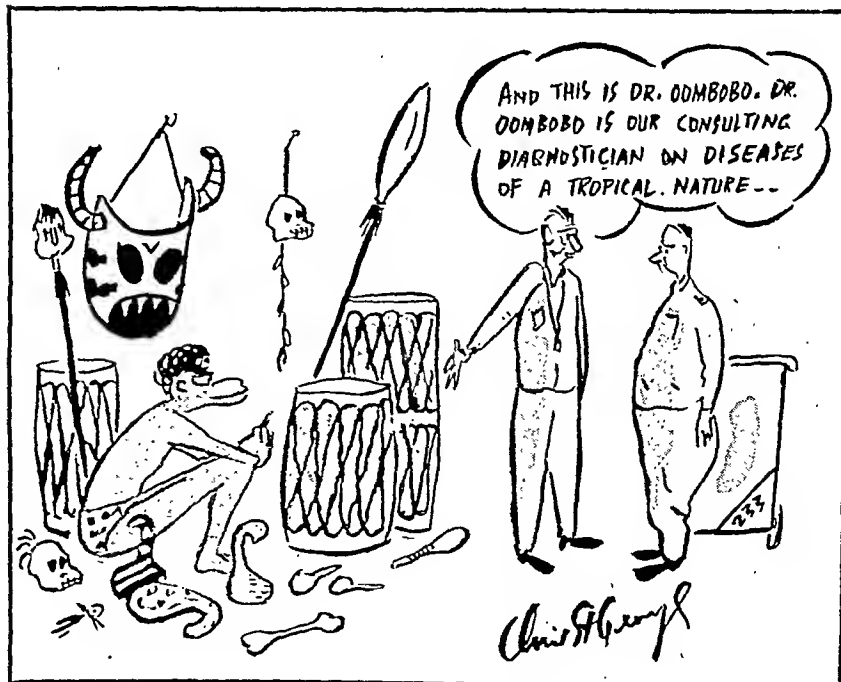
In my lover's arms I tremble,  
With hot and fevered brow;  
But she holds me less in each fond  
caress,  
So she'll be leaving now.

My sweetheart is Malaria,  
And I met her in Bataan;  
I'm just one of her many loves.  
But still her favorite man.

#### MEDICAL LOGICIAN

A Chicago physician whose foresight was verified is Brigadier General G. M. Blech, Army Medical Corps, who wrote "Medical Tactics and Logistics" (published by Charles C Thomas in 1934) to afford medical officers, physicians, and medical students a fundamental idea of the nature of their duties in the event of war.

These concrete tactical studies to develop the leadership of responsible medical officers before, during, and after battles was valuable in particular to medical instructors of the Medical Reserve and the National Guard before and during World War II. The book, intended primarily to enlist the consideration of medical practitioners in problems of national defense, is written in an easy style. The other important avocations of this Chicago surgeon are studies on strategy and, most appropriately for a logician, the game of chess



# Primary Atypical Pneumonia

H. L. ALEXANDER\*

WASHINGTON UNIVERSITY SCHOOL OF MEDICINE, ST. LOUIS

IN THE latter half of the past decade, descriptions of a peculiar respiratory disorder began to appear in the literature. The disorder bore a resemblance to bronchopneumonia, lobar pneumonia, influenzal pneumonia, and other common respiratory diseases, and yet there were certain distinctions which identified it as something new. One of these in particular was the roentgenographic shadow of the pulmonary lesion. The disease was designated by a variety of names, as indicated in the table on the next page. This table, which reveals but a fragment of the literature on the subject, also shows the widespread geographic distribution.

The question has naturally arisen whether primary atypical pneumonia represents a new clinical entity or whether it is the discovery of a disease long present. Those who have debated this pointed out that the preserved lungs from soldiers in the Civil War and those examined from cases of pneumonia in the first World War showed lesions somewhat resembling those of primary atypical pneumonia. However, there now seems to be little doubt in the minds of most investigators acquainted with the disease that, in its present widespread distribution,

we are dealing with a new clinical experience.

Before considering the broader aspects of primary atypical pneumonia, its clinical features will be examined. Material for this presentation was secured from various published reports, especially that of the epidemic at Camp Claiborne, Louisiana, from case records from the Barnes Hospital, and from pathologic specimens in the Army Medical Museum.

There is nothing distinctive about the symptoms of onset. Those that occur in the majority of cases are cough, fever, chilliness, headache, and malaise. In less than one-half the cases, substernal pain, coryza, sore throat, pleural pain, bloody sputum, and rigor are present, and in that order. A similar incidence of occurrence of the same symptoms manifests itself in certain cases of acute bronchitis and bronchopneumonia. Consequently, at the onset, suspicion is not immediately aroused that one is dealing with primary atypical pneumonia.

The most troublesome symptom is cough. This usually ushers in the disease. It is frequent, intermittent, and at first unproductive. Eventually the cough produces mucoid sputum, not grossly purulent, and in some 10 per cent the sputum is bloody. True hemoptysis rarely occurs. After a few days the other symptoms of

\*From the Department of Medicine, Washington University, and Barnes Hospital, St. Louis.

onset appear. In about 30 per cent of cases pain in the chest is complained of. It is usually substernal and probably represents bronchial irritation. Occasionally typical pleuritic pain may occur in some cases.

Other occasional symptoms are referable particularly to the upper respiratory tract and include coryza, sore throat, and pharyngeal and laryngeal irritation. Although chilliness is a prominent symptom of onset, rigor, as it occurs at the onset of lobar pneumonia, is rarely found. Signs of irritation of the upper respiratory tract are less frequent than physical signs. Inflamed throat is observed in more than one-half the cases. Occasionally acute follicular tonsillitis, and nasal congestion, sometimes with crusting, appear.

The physical signs, particularly at the onset, are still less distinctive. Râles are fairly constant, but in the beginning are not heard in about one-half the cases. Moderate prostration and inflamed throat are frequent. Ronchi, dullness to percussion, nasal congestion, severe prostration, and abnormal breath sounds may follow. Some of these signs gradually make their appearance as the disease progresses, but there is also a correlation between their presence and the severity of an attack. Thus, in a few cases that are essentially asymptomatic, there may be no physical signs. Those occurring in atypical pneumonia are frequent also in pneumococcal pneumonia and in influenzal pneumonia. This again emphasizes the difficulty of making an early diagnosis without the help of a roentgenogram of the lungs. Doubtless many cases escape detection and are assumed to be bronchitis or influenza.

The roentgenographic shadows of this disease are fairly distinctive. At first there are accentuations of the hilar markings on one or both sides. Hazy shadows then project out toward the periphery. These appear as mottling which merges into uniform densities. In more than 80 per cent of the cases the lower lobes are involved.

These shadows usually appear early, within the first few days, and as a rule before abnormal physical signs in the lungs can be elicited.

A few days after onset fine to moist râles can be heard over the roentgenographic shadow, which by that time is well developed. Dullness to percussion may then be elicited, and occasionally some changes in breath sounds. The shadows in the films gradually disappear, but physical signs, which appear slowly, may persist for some days thereafter.

THE clinical course is variable. In a few instances the patient is asymptomatic, and the disease is detected by accidental roentgenographic examination. In mild cases there may be an intermittent, dry, unproductive cough for a few days. Toward the end of the first week the usual typical manifestations appear, and in another week recovery has occurred. In the more severe examples, everything is intensified. During the second week the temperature curve may be of a swinging type ranging from 37° to 40° C., accompanied by chills. The patient appears quite prostrated; respirations are increased but the pulse rate is not greatly elevated. There may be some cyanosis. Many

#### TITLES REFERABLE TO ATYPICAL PNEUMONIA

YEAR	PLACE	AUTHORS	TITLE
1935	Hawaii	Bowen	Acute Influenzal Pneumonia
1936	Texas	Allen	Acute Pneumonitis
1937	England	Scadding	Disseminated Focal Pneumonia
1938	England	Gill	Pneumonitis
1939	New York	Smiley <i>et al.</i>	Acute Interstitial Pneumonitis; a New Disease Entity
1939	Minnesota	McKinley	Acute Diffuse Bronchiolitis
1939	Oregon	Miller <i>et al.</i>	Bronchopneumonia of Mild Severity
1940	Massachusetts	Murray	Atypical Bronchopneumonia; Possibly Due to a Filterable Virus
1941	Oklahoma	Ackermann	Roentgenologic Considerations of Influenzal Pneumonitis
1942		Sur. General	Primary Atypical Pneumonia

coarse râles appear over the lesion. Gradually the fever subsides and recovery becomes apparent during the third week. Occasionally evidence of the disease persists into the fourth or sixth week without apparent complications.

Laboratory findings are unrevealing except for an absence of leucocytosis. In the majority of cases the white blood count ranges between 6,000 and 10,000. In some instances, during the height of the disease, it may rise to 18,000 for a brief period. The differential count is not distinctive, nor are other laboratory data except the titer of cold agglutinins. Apparently the serum of some patients with primary atypical pneumonia, particularly those in whom the disease is severe, has the capacity of agglutinating red blood cells at cold temperature. Titers of 1200 or higher are not uncommon. These agglutinins may appear during the second week; they increase as the disease progresses, and gradually subside as recovery occurs; they may, however, persist well into convalescence. This reaction is, of course, not specific for primary atypical pneumonia, but its frequency in this condition and comparative rarity in others have important supportive diagnostic value.

When the several components of primary atypical pneumonia are assembled, the picture of the disease becomes apparent and offers little diagnostic difficulty. It is at the time of onset and the earlier days of the infection that the true nature of the disease is often undetected.

**T**REATMENT is quite symptomatic. Sulfonamide drugs have been thoroughly tried, and although occasionally they seemed of benefit as judged by an abrupt and permanent fall in temperature, this was rarely the case. Statistical studies made at Camp Claiborne indicated that less than 5 per cent gave an apparent prompt response to chemotherapy in contrast to almost 80 per cent of patients with pneumococcal pneumonia who responded to the drug. Sulfonamides are indicated in complications in which susceptible organisms are involved. No data on the use of penicillin is available.

The most troublesome symptom to combat

is cough. This at first appears to be an ineffectual attempt to raise tenacious mucoid sputum. As the cough becomes productive, it is less disturbing. Codeine in a vehicle containing potassium iodide, which tends to liquefy the sputum, is often helpful. At the height of the disease, respirations are rapid and cyanosis may appear. Much comfort may be derived by oxygen inhalation, preferably in a tent. Cardiac embarrassment is very unusual and digitalis used as a routine supportive measure is not indicated.

Convalescence may be slow after a severe infection, but usually after a week or two the patient feels no after effects. Recurrences have been observed—in a few cases, three times—but subsequent attacks have been of milder severity.

Complications are surprisingly infrequent. Pleurisy as recorded by roentgenographic evidence occurs occasionally, and in a few cases effusion developed with clear straw-colored fluid. Infection of this fluid has been recorded during the intercurrent of an acute upper respiratory invasion with hemolytic streptococcus. Four cases of empyema with two deaths are described in the literature. Patients who have pleurisy with effusion usually have a prolonged convalescence with slow subsidence of the fluid accumulation. Pulmonary abscess has been recorded once.

Nausea, vomiting, diarrhea, and jaundice are rare. Herpes is occasionally observed. Meningisms and encephalitis have been reported.

Atypical pneumonia has appeared postoperatively in the puerperium, and after measles. When it complicates heart disease, the mortality is high.

The prognosis is excellent no matter how ill the patient appears to be. Death is infrequent, about 0.3 per cent in a large series of assembled statistics. When it does occur, there has been usually a complication, such as empyema, encephalitis or pre-existing cardiac disease. Rarely does death occur in cases of patients with apparently uncomplicated primary atypical pneumonia. Consequently, pathologic material is exceedingly scarce.

Grossly, the lungs present a picture of localized hemorrhagic pneumonia. The lesion, evi-



dently an interstitial pneumonia, is located in the alveolar walls, and these walls show congestion and infiltration with mononuclear cells; these include monocytes, lymphocytes, and plasma cells. Neutrophils are few. A similar reaction occurs around the blood vessels and in the interstitial tissues surrounding the bronchi. The alveoli contain edema fluid in which monocytes and red blood cells predominate, and some eosinophils and occasional neutrophils may be observed as well. The bronchial mucosa shows some evidence of purulent infection with areas of ulceration and exudate containing mostly neutrophils. Enlargement and occasional necrosis of the malpighian corpuscles of the spleen occur (Longcope described splenomegaly in some of his cases), but other visceral lesions are not distinctive.

THE epidemiologic aspects of primary atypical pneumonia are of considerable interest. Although its distribution is widespread, with cases reported in such separated localities as Hawaii, England, and Texas, its attack rate is low. Since no definite etiologic agent has been isolated, the mode of spread has not been finally proved. Careful studies of possible transmission by mosquitoes, ticks, contaminated food and water, and other vectors by the commission that studied the outbreak at Camp Claiborne failed to reveal any clue. On the other hand, there is suggested evidence that the disease is transmitted by direct contact from person to person. For instance, by far the highest incidence of cases in Army camps occurred among hospital personnel. This is often true in civilian establishments. A patient with primary atypical pneumonia at Barnes Hospital in 1940 was assigned to a clinical clerk, who two weeks later contracted the disease. The floor nurse who served her likewise contracted it, as did an interne who looked after them both. The incubation periods for the latter two cases were set at 11 and 15 days, respectively. In several other cases, incubation periods have been estimated, and these appeared to vary widely, but in general they appeared to be long. This makes con-

trol difficult. Respiratory isolation is indicated.

Of interest is the fact that in carefully observed epidemics simultaneous outbreaks of the disease were widely scattered, and it has been said that sites of origin were comparable to the pattern of those of acute appendicitis. There has been no indication of radial spread as occurs in measles or influenza. The present representative point of view is that unrecognized cases transmit the infection by direct contact, but since the attack rate is low, large local epidemics do not occur.

The etiology of primary atypical pneumonia is entirely unknown. Attempts to isolate a common organism from the blood, sputum, and urine have consistently failed. Secretions secured through a bronchoscope during the various stages of the disease have consistently failed to reveal significant cultures. In some recorded fatal cases extensive bacteriologic studies conducted during life and postmortem tissue examinations were likewise unrevealing.

It is true that from time to time viruses have been isolated. However, these apparently were incidental findings, since they appeared in only a few cases and, when they were found, there was little uniformity among those isolated. Moreover, several of these viruses had been identified with other diseases. Thus, the viruses of psittacosis, of meningopneumonitis, and of lymphogranuloma venereum, as well as the rickettsia of Q fever have all been identified and have fully conformed to carefully controlled serologic tests. Other viruses not heretofore identified have been found in patients with primary atypical pneumonia, but these disappeared for the most part during attempted preservation through animal passage. Certain animals such as the mongoose and cotton rat developed an atypical form of pneumonia when injected with the washed sputum from patients, but as yet these observations have no established significance. Although several investigators suspect that a virus as yet not identified is the etiologic agent, the cause of the disease remains wholly unknown, and the term "primary atypical pneumonia" still awaits a more definite designation.

# The Management of Ulcerative Colitis

J. ARNOLD BARGEN\*

MAYO CLINIC, ROCHESTER, MINNESOTA

IN DISCUSSING the management of ulcerative colitis it is of utmost importance to have in mind a proper classification of the diseases included under that designation. When one uses the term "chronic ulcerative colitis" one is referring to a general clinicopathologic syndrome, the conditions grouped under which have some clinical similarities—all present inflammatory and destructive changes of the intestinal wall, yet each has certain features that set it off as a disease entity.

It is of some interest to follow the historical development of our knowledge of the various forms of ulcerative colitis. These will be discussed in a more or less chronologic order with remarks regarding characteristic features of each form of colitis and suggestions for the management of each type.

## TUBERCULOUS ULCERATIVE COLITIS

Until recent years the first described and best known form of ulcerative colitis was tuberculous ulcerative colitis. Although infection of the intestine by *Mycobacterium tuberculosis* is primarily of the small intestine, it will commonly involve both small and large intestine, and

some recent evidence tends to substantiate the thought that primary tuberculosis of the large intestine may occur. In the average case tuberculous ileocolitis is secondary to tuberculosis of the lungs or tuberculosis elsewhere in the body. The ulcers of this disease will be distributed irregularly and associated with lesions visible on the serous surface of the bowel and with miliary tubercles. The infection will commonly attack the ileocecal coil, and only in the late stages will the lesions progress sufficiently caudad to be visible through the sigmoidoscope. Thus, the roentgenologic examinations will be the essential diagnostic examinations and will be featured by characteristic irritability with rapid emptying and filling of the ileocecal region. Great irregularity of the intestinal lesions will be observed in the roentgenogram. The smooth contour of the intestinal wall so commonly seen in cases of streptococcal colitis is not present in tuberculous ileocolitis because the disease involves the mucosa more than the wall of the bowel.

Although some chemotherapeutic agents related to the sulfonamide compounds, such as promin and promizole, bid fair to have value in the management of this disease, the accepted treatment is still adequate care in a sanatorium. Such care should include carefully regulated

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Figure 1. Extensive ulcerative tuberculosis of the ileocecal coil and ascending colon.

sun baths, a high caloric diet, including especially large amounts of vitamin C in the form of such substances as tomato juice, and a properly planned program of rest. Pneumoperitoneum and oxypertoneum have been found helpful in some cases. Roentgen therapy also has its advocates.

#### AMEBIC ULCERATIVE COLITIS

Knowledge of this form of ulcerative colitis, commonly known clinically as amebic dysentery or by the more inclusive term of amebiasis, dates to the early part of this century. As in tuberculous colitis, the lesions of this disease are largely confined to the right half of the large intestine but, sharply in contrast to those of tuberculosis, they are always limited to the large intestine and stop or begin abruptly at the ileocecal valve. The lesions are localized primarily in the cecum and possibly in the flexures of the large intestine, although the entire large intestine may be involved. If the disease has advanced sufficiently toward the rectum so that lesions are visible in its mucous membrane,

they present a very characteristic appearance. The ulcers give the impression of being punched out, with raised edges covered by a fleck of mucus and a hyperemic zone around the individual ulcer. Between the ulcers the mucous membrane is relatively normal.

The disease largely affects the mucosa instead of the wall and there should be little difficulty in distinguishing this type of ulcerative colitis from the streptococcal variety of colitis. Consequently, the symptoms are quite at variance with those of the streptococcal variety. Bleeding occurs relatively late in the disease instead of being present as one of the first symptoms. The severe prostration of the fulminating type of ulcerative colitis is observed rarely. The patient is usually in a relatively good condition.

Roentgenologic examinations, too, show a rather characteristic deformity of the large in-



Figure 2. Extensive ulcerative disease of the large intestine due to infection by *Endamoeba histolytica*. Note the coning of the cecum.

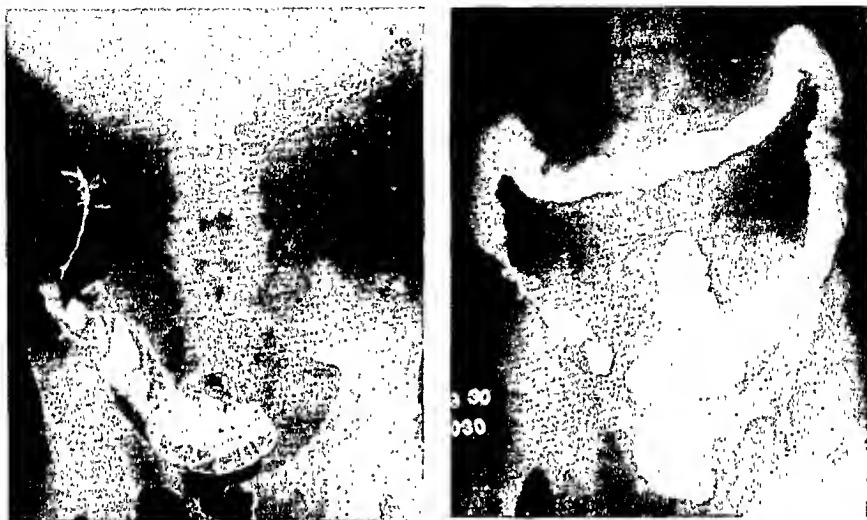


Figure 3. Roentgenograms in a case of extensive and severe amebic colitis: (a) by double-contrast method of examination; (b) after barium enema.

testine when the disease is sufficiently advanced. However, even early in the disease there may be the characteristic features in the cecum; namely, some narrowing and irritability when no other colonic lesions exist. With the progress of the disease the cecum becomes coned or narrowed to a point and the entire ascending colon may be narrowed irregularly. This is not a smooth diffuse narrowing such as one encounters in the streptococcal type of ulcerative colitis. As the rectum is approached, there will be less and less roentgenologic evidence of disease except in those cases in which the greatest disease is at the flexures or in unusual segments.

Of all the forms of ulcerative colitis, the amebic is the most amenable to treatment. Without any additional supportive treatment, amebiasis can be controlled or perhaps cured in most instances by the properly timed administration of a suitable combination of prepara-

tions of ipccac, arsenic, and iodine. A suitable program for the administration of these chemotherapeutic drugs is as follows:  $\frac{2}{3}$  grain (0.043 gm.) of the active principle of ipecac; namely emetine hydrochloride, administered subcutaneously twice daily until 4 grains (0.26 gm.) of the drug has been given. Beginning on the same day that the administration of emetine is begun, 0.25 gm. of carbarsone should be given three times a day for four days. This is to be followed by 0.25 to 0.5 gm. of diodoquin for seven days and this in turn is to be followed by a second course of emetine and carbarsone. A series of stools should be examined after this for the trophozoites or cysts of *Endamoeba histolytica*.

#### CHRONIC BACILLARY DYSENTERY

Soon after these two conditions, tuberculous

and amebic colitis, had been well established as entities, many other cases of ulcerative intestinal disease not belonging to either of these categories were observed by clinicians everywhere. When they occurred in regions where bacillary dysentery was prevalent or endemic they were promptly classified as cases of chronic bacillary dysentery. As will be pointed out, later, this led to great confusion and wrong designation of many cases of ulcerative colitis. We do recognize, however, a form of ulcerative ileocolitis which follows in the wake of severe bacillary dysentery due to one or several of the strains of *Shigella paradysenteriae*. The fact that this condition follows, although very occasionally, an epidemic of acute bacillary dysentery will in itself be suggestive of the diagnosis. However, the diagnosis in the final analysis will depend on the presence in the blood of agglutinins—in significant titer, at least 1:320 or higher—of one or several strains of *Shigella paradysenteriae*. The lesions of this disease will be irregular and disseminated. In the occasional case in which extensive destructive ulcerative disease occurs, secondary invaders may be responsible for the late lesions. When lesions are visible through the sigmoidoscope and are irregular as far as size, extent, and mucosal appearance are concerned, they are particularly striking. It has been said the lesions are characteristic because of irregular, yet extensive, distribution. This impression is substantiated by the roentgenologic appearance of the bowel in these cases.

Just as in cases of acute bacillary dysentery, so in cases of chronic bacillary dysentery, the sulfonamide compounds, and particularly sulfasuxidine and sulfaguanidine, have given very satisfactory results. In cases of mild dysentery and of dysentery caused by organisms of the Sonne type the disease has responded well to large amounts of sulfasuxidine. In cases of more severe dysentery and particularly of dysentery caused by the Flexner and Shiga strains of these organisms the disease has responded better to sulfaguanidine, given again in fairly large doses. Type specific serums and bacteriophages have been used very little re-



Figure 4. Extensive ulcerative disease of the large intestine. Note the mucosal damage as illustrated in the evacuation roentgenogram.

cently and then only in cases of very severe dysentery in which every measure of therapy previously found useful has been indicated.

#### STREPTOCOCCAL ULCERATIVE COLITIS

In many of the cases in which colitis was thought earlier to be present on the basis of chronic bacillary dysentery it proved later to be of streptococcal origin. The streptococcal form of ulcerative colitis has perhaps the most characteristic clinical and pathologic manifestations and hence shows typical proctoscopic and roentgenologic features. Its lesions begin in the most distal segment of the rectum, just above the anal canal. Diffuseness of involvement of the bowel is its pathognomonic feature. Whether 1 inch (2.5 cm.) of the lower part of the rectum or 5 feet (1.5 meters) of bowel are



Figure 5. The typical roentgenogram of the narrowed tube-like colon filled with barium of a patient suffering from thrombo-ulcerative colitis.

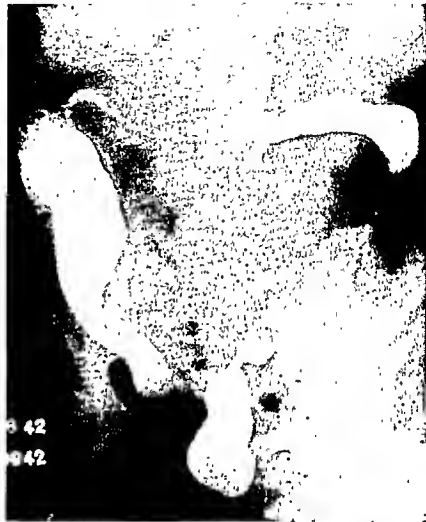


Figure 6. Very advanced and destructive ulcerative colitis in which there is segmental narrowing and extensive involvement of the distal portion of the ileum by the disease.

involved, the involved segment always is affected in its entirety, its complete circumference and the deeper layers of the wall and the mucosa secondarily being involved. This gives the granular, easily bleeding mucous membrane so characteristic of this lesion. The disease tends to spread upward until the entire colon, and even the lower part of the ileum in the late stages of the disease, become involved.

Since it is primarily a disease of the intestinal wall, a very characteristic roentgenologic picture develops. The bowel becomes diffusely narrowed, haustral markings are erased, the flexures and curves become more angulated than those of the normal bowel, and the result is a smooth tube. In this respect streptococcal ulcerative colitis differs from all other forms of ulcerative intestinal disease, except perhaps regional enteritis when it is confined to the

distal portion of the ileum. The latter condition has, however, many features to distinguish it from streptococcal ulcerative colitis.

Because of the relatively high incidence of the streptococcal form of ulcerative colitis and because of the consistency with which its clinical, proctoscopic, and roentgenologic manifestations conform to a certain pattern, I incline to the use of this type of ulcerative colitis as a norm and to describe other types chiefly by noting in what respects they differ from it.

The streptococcal form of ulcerative colitis manifests itself in a variety of ways but in general the clinical manifestations follow one of three general courses. When the lesions are limited to the lower segments of the large intestine, particularly the rectum and rectosigmoid, the onset of symptoms can be described as insidious. The patient may have normal

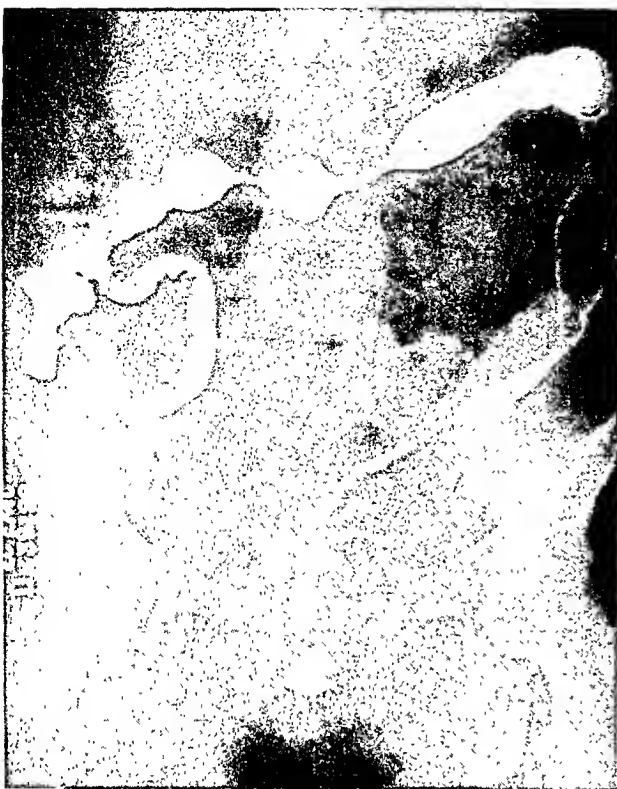


Figure 7. Marked diffuse narrowing of the large intestine with additional localized formation of stricture.

motions of the bowel but in addition may pass two or three or many bloody, purulent rectal discharges. He may not have any other important systemic symptoms except that he will gradually begin to speak of not feeling well. His complaint of not feeling up to par may gradually become more frequent as the number of rectal discharges increases. Ultimately a mild form of diarrhea may develop.

The second common onset may be classified by saying that the symptoms are severe. The patient may start rather suddenly with bloody diarrhea, low-grade fever, gradual loss of appetite, and with them, loss of weight and all the concomitants of a moderately severe illness. All the symptoms may start in a fulminating manner with an onset almost like that of lobar pneumonia or other similar serious illness. There will be a high fever, massive discharges

of bloody material from the rectum, great prostration, and rapid depletion.

A patient's symptoms may remain in the insidious form for months or years and then at the time of an infection of the upper part of the respiratory tract, some other intercurrent illness, or perhaps some severe nervous trauma, there may be a sudden exacerbation of the disease and a change to a severe or even fulminating form.

The question is often raised whether these are different diseases or stages of the same disease. Experience seems to indicate that these are stages of the same disease attacking patients in various ways. Thus, one must be ever on the alert for the occurrence of this disease in these several forms so that it may be distinguished carefully from the types of colitis which are to be discussed presently.

THE treatment of this well-defined entity is not as satisfactory as its clinical and pathologic picture might suggest. Nevertheless, if certain basic principles of therapy are followed, the end results will usually be very gratifying. Since the disease is of the nature of a chronic destructive infection, an adequate rest program must be devised. This may not necessarily mean rest in bed, for in the case of the milder type, in which the infection is confined to the distal segments of the large intestine, rest in bed would hardly be wise. Furthermore, the dictum that "disease below the diaphragm makes for pessimism" is well illustrated in this condition and therefore restful relaxation or a restful recreation is often more valuable than complete physical rest. However, when the disease advances to more proximal segments of the bowel so that diarrhea is severe, total body rest may be indicated. Reduction of intestinal peristalsis by any available means must be considered. Although minimal amounts of opium and its derivatives are indicated in selected cases, other sedative preparations and powders acting as adsorbents will often do much to allay intestinal peristalsis and thus create intestinal rest.

The second important measure of therapy is

to improve bodily resistance to a severe infection and to replace the tremendous losses of food, especially proteins and vitamins, sustained in an active diarrhea. Thus a diet rich in calories, proteins, and vitamins and low in residue is desired; however, it may be necessary to approach this very gradually because during the fulminating stages of the disease it is often necessary to withhold food by mouth entirely. It may be necessary to begin by feeding perorally, gradually increasing the food intake very cautiously until finally, in the more chronic stages of the disease, a diet based on the foregoing principles and containing well over 100 gm. of protein and extra amounts of vitamins is allowed.

Further protection against streptococcal ulcerative colitis is achieved by the cautious administration of an antistreptococcal vaccine. This can be given in increasing amounts, the injections being maintained always under the point of any local or systemic reaction.

Since most of these patients will come under the physician's observation after there has been considerable loss of blood, anemia will almost invariably be present and may reach profound degrees. Hence the fourth method of combating the condition will be the administration of repeated blood transfusions. The average patient will tolerate a series of small transfusions, for example, 200 to 300 cc. of blood, better than the larger amounts of blood commonly given, that is, 500 cc. The various preparations of iron commonly administered to patients suffering from the hypochromic type of anemia are so often intestinal irritants that, when used, they should be given in minimal amounts and administered with great caution.

Various drugs of the sulfonamide series such as neoprontosil, sulfasuxidine, sulfaguanidine, and sulfathalidine have had ample trial in combating the active stages of streptococcal ulcerative colitis. So far, neoprontosil seems to be the drug of choice of this series for this type of colitis, with sulfathalidine following close behind in efficacy. The average amounts administered may range from 50 to 120 gr. (3.2 to 8 gm.), given in divided doses daily.



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Penicillin has had ample trial in this form of ulcerative colitis. It has been found most effective among the severely ill patients who have all the concomitants of fever and other symptoms indicating a septic process. Large doses, at least 50,000 units every three hours, are indicated. Other antibiotics, such as streptomycin, have not met with such success, and reasonably.

**R**EMOVAL of foci of infection, such as obvious ones in tonsils and teeth, is of prime importance in combating this infection. Many other measures will be utilized in the management of individual cases of this form of colitis.

The disease has two definite surgical phases. The one phase concerns itself with supportive measures, such as the drainage of a perirectal abscess or of an abscess resulting from a walled-off perforation; the other is in the nature of curative surgical treatment—namely, ileostomy followed by subtotal or total colectomy.



From a study of a series of 185 consecutive cases of ileostomy reviewed by Drs. Pemberton, Ashburn, Lindahl, and myself, a review of which was published in the *Annals of Internal Medicine* in January 1943, and from our experience in observing these patients, it has become apparent that ileostomy and other subsequent surgical treatment are best limited to complications of ulcerative colitis such as extensive perirectal infection with abscess and fistula, intestinal stricture, extensive secondary polyposis, a walled-off colonic perforation, secondary malignant neoplasia, and the occasional case of severe arthritis. Then, of course, ileostomy is performed, not for ulcerative colitis, but rather for another condition complicating the ulcerative colitis. Only occasionally will ileostomy be indicated for the so-called intractable ulcerative colitis. Hardly ever will it be indicated for severe, fulminating ulcerative colitis, to which I have referred repeatedly.

#### ULCERATIVE COLITIS DUE TO THE VIRUS OF LYMPHOGRANULOMA

Another form of ulcerative colitis in which the lesions are limited to the large intestine is that caused by the virus of venereal lymphogranuloma. Here again the lesions start in the rectum and distal segments of the large intestine. The disease also affects the wall of the bowel but involves not only the wall but also lymphatic structures around it. Thus, a condition develops in which there is a stiff tube which, through the proctoscope, feels and looks like perirectal inflammation. There may be multiple small sinuses from the mucous membrane to the deeper structures, and thus a rather definite proctoscopic and roentgenologic picture results. The disease will be limited to the rectum and rectosigmoid structures, and the normal bowel will be reached much more abruptly than in the streptococcal variety. Almost invariably the patient will feel generally well and his complaints will be mostly in reference to the local rectal condition.

The diagnosis in this type of case will depend largely on the history of previous venereal in-



Figure 8. The abrupt transition from the diseased to normal bowel in the rectosigmoid region of a patient suffering from ulcerative colitis due to the virus of venereal lymphogranuloma.

fection, possibly the presence of buboes, and very commonly among women the presence of preceding vulval lesions. The Frei reaction will be positive. But even if these conditions exist, the diagnosis of colitis due to the virus of venereal lymphogranuloma is not tenable if characteristic lesions of the rectum do not exist.

IT USED to be said that "When a patient once has an infection by the virus of lymphopathia venereum, he will always die with it but never from it." The advent of the sulfonamide compounds may well change this dictum. Sulfathiazole, sulfasuxidine, and sulfaguanidine have been particularly efficacious in the treatment of this infection. The latter two, because

of their relative lack of toxicity and minimal systemic absorption or ready excretion, have been particularly useful since they can be administered in fairly large doses over a long period. Ten to fifteen grams of one of the drugs have been administered daily for weeks to several months in selected cases resulting in a gradual reduction of the bloody rectal discharges. The stools have even become soft to formed, approaching normalcy not only in their consistency but also in their numbers. The intestinal wall has become softer and more pliable and the rectal lumen has gradually enlarged.

When the stricture of the rectum has reached a stage at which the fibrotic elements are in the ascendancy and little seems to be accomplished by medical treatment, surgical intervention may become advisable. Since the progress of this disease is exceedingly slow and since the lesions even in the late stages usually remain confined to the rectum and sigmoid, colostomy in the left half of the large intestine and usually in the upper part of the sigmoid is sufficient to control the condition and to give relief from any obstructive features.

#### ULCERATIVE COLITIS OF UNKNOWN ORIGIN

There still exists a fairly large group of patients who have ulcerative colitis of unknown origin. Those who still cling to the terms "non-specific" or "idiopathic" might well apply them to these groups of cases; however, the phrase "of unknown origin" can be much more suitably applied.

Here again the ulcerative disease may be extensive, involving long stretches of small and large intestine; on the other hand, it may involve only the rectum and sigmoid. Whatever segment is involved, the appearance of the lesions is at variance with those of the conditions described which have a specific cause and strikingly at variance with the appearance of the bowel in the streptococcal variety of ulcerative colitis. Agglutination of *Shigella* paradyenteriae will be absent. Cultures made from the lesions and examinations of the stools will not be diagnostic. The lesions will be distrib-

uted irregularly and tend to resemble those of amebiasis or tuberculosis. Yet, one usually will detect differences. The differences are sometimes hard to describe and it has been said that the ulcers are characteristic by being so uncharacteristic. The same thing will hold true for the roentgenologic examination. This is the group of cases that will particularly tax the physician's ingenuity and the response to one form of therapy or another will often be minimal.

#### REGIONAL ULCERATIVE COLITIS

Another form of ulcerative colitis which may or may not be of similar origin to the last described has been designated as a regional type of ulcerative colitis. The lesions involve isolated segments of intestine and may involve any segment, much in the manner of regional ileitis except that here the site of the disease is the colon. The lesion may be subacute or chronic and usually is quite destructive. However, there may also be evidence of hyperplastic changes. Commonly, segments of the intestine from 6 to 12 inches (15 to 30 cm.) long are found to be involved, with entirely normal bowel distal and proximal to the lesion, and the rectum is never involved. In other words, this segmental type of colitis involves regions of the large intestine above the view of the sigmoidoscope. The wall of the involved segment is also stiff and thickened, but the involvement is not as diffuse, regular and smooth as in the streptococcal type of ulcerative colitis. Thus, the roentgenologic examination is the most important objective method of establishing a diagnosis.

USUALLY such a regional type of colitis remains localized to a segment of large intestine for months or years. Very occasionally, however, it has been known to spread orad and caudad so that ultimately even the distal portion of the ileum has become involved. This outcome has initiated a difficult situation, indeed, and has always brought up the question whether this and so-called regional ileitis may



Figure 9. Involvement of most of the ascending and transverse colon by ulcerative colitis.



Figure 10. Fairly active ulcerative colitis of the descending colon.

*Illustrations from J. Arnold Bergen's "The Modern Management of Colitis,"  
Courtesy of Charles C Thomas, Publisher, Springfield, Illinois.*

not be the same or closely related conditions. However, the fact that regional ulcerative colitis usually remains localized to the large intestine, whereas regional ileitis commonly spreads from the ileum proximad to involve the jejunum and distad to involve the cecum and ascending colon, would seem to point to their being separate entities.

In these cases the medical treatment is largely confined to the problem of rehabilitation for future surgical treatment. If the patient has fever and other concomitants of an active infectious disease the preoperative administration of sulfasuxidine in large amounts for days or weeks is indicated. If the patient has lost much weight and is anemic, these conditions should be corrected. Every known measure of therapy should be invoked to bring the patient to the

best state of nutrition and to reduce the infection to a minimum before resection is undertaken.

#### ALLERGIC COLITIS AND AN INTESTINAL DISORDER OF THE NATURE OF A DEFICIENCY SYNDROME

The type of intestinal disorder of the nature of a deficiency syndrome, other than sprue and pellagra, should actually not be discussed here. It is brought up only because there are still some who feel that the deficiency state plays a primary role in some of the types of ulcerative colitis which have been discussed. The history of patients suffering from an intestinal disorder in which a food deficiency is important is usually characteristic. Such persons may have gone for months or years on an inade-

quate dietary regimen. The result may be atrophy of the intestinal wall. The appearance of the bowel through the sigmoidoscope may suggest diffuse hyperemia. No real ulcers will be present. The roentgenogram may show dilatation of the large intestine with minimal changes of the mucosal pattern in the form of what appears to be a "fuzziness" of the mucous membrane. In the small intestine a typical pattern of barium puddling and segmentation will be observed.

What has been said about the deficiency syndrome affecting the intestine might also be applied to so-called allergic colitis. Everyone will accept the fact that there are patients who exhibit symptoms of intestinal allergy. Few will be impressed by the thought that such an allergy is a primary factor in ulcerative intestinal disease. It seems obvious that occasionally in severe cases of intestinal allergy, mucosal abrasions may occur so that ulcers of a transient nature may be present. There is, however, little or no evidence available that these form the basis of a type of ulcerative colitis. It would seem better to consider intestinal allergy as a condition quite apart from the great problem of ulcerative enterocolitis. However, it is well to realize that intestinal allergy may play a part in many ulcerative intestinal inflammations but that it is not necessarily causative in any of them.

The treatment of these two conditions would seem obvious.

#### SUMMARY

The fact that there are many varieties of ulcerative colitis has been emphasized. It is of the utmost importance that the nature and cause of the disease in a given case be established as nearly as possible. Each form of colitis described has some characteristic features which set it apart from the others. In the streptococcal variety, the diffuseness of involvement and the typical proctoscopic picture together with the finding of the streptococcus are important. In the amebic variety, the presence of *Endamoeba histolytica* is essential. In tuberculous colitis, the presence of *Mycobacterium tuberculosis*, together with the typical roentgenologic observations, is diagnostic. In colitis due to virus of venereal lymphogranuloma, the positive Frei reaction and the characteristic appearance of the lesions are essential features. In colitis due to *Shigella paradysenteriae*, significant agglutination titer of the blood serum is the outstanding characteristic. In colitis associated with a deficiency state, the history is all-important. In so-called allergic colitis, the allergic reactions of the patient will be helpful. In the groups of unknown cause and of the regional type, much meticulous, careful study is required. It is important that cases of the latter types be carefully distinguished from ulcerative colitis of specific cause, since the treatment for each type varies significantly from that for other types; therefore, one cannot stress too greatly the importance of a careful differential diagnosis.

## DIAGNOSTIC CLINIC

# Obesity in Adults

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THERE have been many attempts to classify obesity as an aid to distinguish the types or to suggest the use of a therapeutic approach. There is so much controversial argument and experimental data to verify, that I beg your apology for attempting to suggest classification. I do so, however, in order to set forth one or two points that I feel are worthy of your consideration in reference to this subject as you approach treatment.

I imagine that Epstein's classification perhaps is more real when he says that types of patients can be classified who inspire envy or provoke laughter or call forth sympathy. Perhaps we would agree to such a classification. Before I discuss classification, I want to bring out one interesting phase in reference to the hypothalamic obesities, based supposedly upon the foundation laid by clinicians who described lesions of the hypophyseal hypothalamic regions in obese human subjects.

We recall that the hypothalamic obesities were first described by Mohr in 1840 in a 57-year-old woman who became remarkably obese within a year before her death. An autopsy revealed a hypophyseal tumor large enough to

deform the sella and to distort and compress the base of the brain, including the cerebral peduncles, optic nerves and chiasma, and the region of the hypothalamus. No attempt was made either to explain the excessive deposition of fat or to distinguish between the hypophyseal and the hypothalamic injury.

By the time Fröhlich's famous paper was published in 1901, nine similar reports had already appeared. Fröhlich considered the essential symptoms of the disease to be adiposity and genital underdevelopment caused by pituitary involvement that failed to produce acromegaly. His theory of the hypophyseal origin of the condition, although now completely discredited, was supported by the experimental study of Crowe, Cushing, Homans, Bell, and Dott.

Three years later, in 1904, Erdheim questioned the validity of Fröhlich's theory, pointing out that in certain cases of this type of obesity the hypophysis had been found to be relatively undamaged, that no particular type of tumor had been found responsible, and that compression of the base of the brain was invariably present whenever adiposity had been noted.

Erdheim, therefore, concluded that a neural lesion produced the condition, although he was not able to identify the structure concerned.

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His thesis received experimental substantiation when in 1912 Aschner observed adiposity in dogs subjected to hypophyseal operations which were subsequently found to have injured the infundibulum also. Aschner's results were confirmed by Bailey and Bremer and by Camus and Roussy. The matter was considered to be controversial, however, until Smith reported that no obesity followed lesions restricted to the hypophysis of rats, although obesity appeared in rats with concomitant hypophyseal and hypothalamic damage. Grafe, Grunthal, Biggart and Alexander, Hetherington, and Ranson more recently confirmed Smith's previous observations.

Hetherington, and Hetherington and Ranson, with the aid of the Horsley-Clarke instrument, produced hypothalamic obesity in rats, in which for the first time direct hypophyseal involvement was avoided. Hetherington and Ranson also reported their success in producing typical hypothalamic obesity in hypophysectomized rats. Their studies lead to the conclusion that pituitary damage is important in the etiology of obesity only in so far as it may be one cause of hypothalamic pathology by pressure or by infiltration with tumor.

I review that phase because, of course, the work of Long at Yale and his associates, so beautifully carried out by utilizing Ranson's technical procedure to produce the obesity, studied the end results of obesity, which are vital to all of us and which emphasize the fact that we, as physicians, are concerned not with the question of grace nor with the figure, even though it may appeal to our esthetic senses, but with the influence of obesity on longevity and the production of associated sequelae. The experimental animals used in Long's studies at Yale revealed how these hypothalamic lesions increased the appetite, produced chronic glomerulonephritis, caused hypertrophy and dilatation of the gastrointestinal tract, increased the size and weight of the liver, decreased the weight of the ovaries, and brought about changes in sex characteristics in the animals.

The old classification of exogenous obesity as verified by Newburgh at Michigan—to wit,



CLIFFORD J. BARBORKA

that if we overeat and underexercise, we are naturally going to follow the law of conservation of energy and gain weight—is always a most significant factor in any obesity in adults. The endogenous factors are supposedly disorders of endocrine function. If we break those two large groups down, we find that from the standpoint of endocrinopathies we consider primarily thyroid, pituitary, adrenal, and gonad. The nervous mechanism which has been emphasized by Bernhart, Wilder, and others I shall briefly refer to later. I am sure you are thoroughly familiar with the various phases of defective water metabolism and defective salt metabolism as factors which may influence the scale.

THE amount and the kind of food that one eats are naturally prime factors in the production of obesity. Interesting sidelights have been thrown on the so-called exogenous factors by those individuals who prefer to give exceed-

ingly high protein intake. This group bases such a procedure upon the assumption that the specific dynamic action of protein stimulates the rate of oxidation of tissue, and they cite as an example experimental data on such amino acids as phenylalanine, in which we can, of course, get the definite specific dynamic action of that type of food. Another reason for giving a high protein diet is that satiety or a sense of satisfaction is derived, giving the patient a feeling of security.

I don't question that the obese individual means to be honest when he tells you that he is a small eater, but sometimes he forgets to tell you that it isn't a question of three meals a day being small; he forgets to discuss interval feedings in which he indulges. One wonders sometimes whether or not there is some defective mechanism of carbohydrate metabolism comparable to hyperinsulinism which stimulates the hunger desire to compensate by food.

I shall briefly review the endocrinologic factors. To start with, there is the hypofunctioning of the thyroid, which, when it exists, justifies the adjunct therapy of thyroid. It is interesting how few times there is actually a myxedema or marked hypothyroidism associated with obesity when, following the suggestion of Evans and Strang, we calculate on the basis of the tissue actually entering into the intermediary metabolism and disregard some of the extra avoirdupois which should not enter into the *estimated* rate. Thus, in calculating the basal metabolism, it is very proper to take the expected weight into the calculation for the height, age, and sex rather than the extra avoirdupois or obesity, and in so doing, very rarely do we find, unless there is actually a myxedema, that the average patient with obesity has a hypothyroidism associated. There is very little to verify the old *luxus consumption* effort in relation to metabolism.

It is interesting to study the work of adrenal hyperfunction which has justified the adrenalectomies and studies of hormones which supposedly fix blood fats and aid their deposition. Also of interest are the various forms of pituitary dysfunction, the adiposogenitalis of

youth, the adiposis dolorosa disease in the adult, Cushing's disease, some of the studies of the hormones liberated by the anterior lobe which are supposed to aid the deposition of flesh, and the interesting gonad hypofunction and their influence on obesity.

As to the nervous or central organs, Weir Mitchell in 1880 called attention to the possibility of there being a fat center in the posterior part of the medulla. The experimental hypophyseal and hypothalamic work, which was discussed briefly at the beginning of this paper, emphasizes the necessity of having a sane viewpoint of the controversial data, both experimental and human, regarding the conditions for the deposition of fat. The central theory, held both by Bernhart and by Wilder, is that somewhere in the brain, in the visceral nuclei of the tubercinereum in the walls of the fourth ventricle, there is supposed to be pathology that influences obesity.

TABLE 1

TYPICAL FOODS TO AVOID IN REDUCTION DIETS

Sugar and all sweets	Cream
Starches, such as	Vegetables high in
Bread	carbohydrates, such as
Cereals	Potato
Macaroni	Shelled peas
Spaghetti	Shelled beans
Pastry, pie, cakes	
Sweet desserts	Meats high in fat, such as
Fats, such as	Pork
Butter	Lamb chops with
Salad oils	large amounts of fat

IRRESPECTIVE of what the appearance suggests as to the etiologic factors behind the case, we have very definite methods that we believe are justifiable in the approach to the reduction therapy. We must, of course, study very carefully each individual's food habits and drink habits. We must complete our diagnostic examination so that if adjunct therapy is necessary we do not neglect it after an effort has been made to curtail food intake.

We must calculate a diet for each patient, and, most important—just as it is in the success-

ful control of diabetes—is the necessity to educate the patient and follow through his problem in order to sustain our efforts.

Of course, we are not discussing at the moment the ordinary type of mild excessive weight that justifies only your attention to the typical food the patient must avoid—all the obvious starches, pastries, pies, candies, etc., that naturally are high in caloric value and of no use to the patient except to pile flesh upon him. (See Table 1).

TABLE 2

## TYPICAL FOODS ALLOWED IN REDUCTION DIETS

Egg	Fish, other than salmon
Milk, skimmed and butter-milk	Shrimp
	Crabmeat
Meat, lean	Fruit, 5% and 10%
Meats, low in fat, such as	Vegetables, 3% and 6%
Chicken, lean portion	Clear soup
Liver	

In Table 2 we emphasize the type of food allowed (and this is only a rough qualitative suggestion): skimmed milk or buttermilk; eggs; lean meats; meats low in fat, such as chicken; fish other than salmon, which is high in fat; fruit and vegetables, choosing the 5 to 10 per cent fruits and the 3 to 6 per cent vegetables; clear soups. These foods, as you readily understand, are low in their caloric value and yet are adequate in their protective mechanism as far as vitamins are concerned.

However, our primary concern is with those stubborn cases that require a definite weighed regimen. The patient must be taught how to follow that regimen. We have, of course, two general types of systems for this purpose. One is the mild reduction regimen which is followed in almost every case, and the other includes the rather radical regimens such as have been suggested by Evans and Strang and others, which advocate tremendous reductions in caloric intake and very radical reductions in the carbohydrate-protein-fat content.

We are attempting to establish daily habits, not to make a dramatic reduction and forget the patient. Therefore, it is necessary to establish new methods of metabolic changes in the patient.

ONE can in two sentences describe a method for instituting a proper reduction regimen. Primarily, it involves taking into consideration not only the weight the patient presents, but also the expected reduction, which may be anywhere from 10 to 40 pounds as the first step. On that basis, we should give 1 gram of protein per kilogram of expected body weight.

The amount of calories in the diet will be anywhere from 800 or 900 to 1400, depending upon the problem. The calories required by the patient will determine the amount of fat in the diet.

The second important point, apart from the protein is the question of the proper amount of carbohydrate. Evans and Strang pointed out that 0.6 gram per kilogram of expected weight reduction is adequate to protect the intermediary phases of metabolism, but in our experience we feel that to protect the antiketogenic fraction of the protein molecule properly we must give approximately 0.85 to 1.5 grams of carbohydrate per kilogram. We must keep in mind the glycogen reserve factors in order to protect the antiketogenic fraction of the protein molecule and give a total oxidizing mixture of the reduction regimen that will attempt to maintain a balance between keto- and antiketogenic factors. Why? Because we are primarily interested in a reduction regimen which will give the patient the correct amount of protein and carbohydrate. If the amount is not correct, it will disturb the nitrogen equilibrium and interfere with the excretion of the water that results from the oxidation of the fat tissue. That factor of water balance is exceedingly important as to the total burning mixture. It has nothing to do, as you know, with the water taken by mouth. Thirst is the answer to that phase of restriction.

If we had an individual of 200 pounds whom



we were going to step down in a reduction effort to 160, we would set up a diet, on the basis of the above calculation, of 60 grams of carbohydrate, approximately 70 of protein, and 40 of fat, which would amount to approximately 900 calories. Such a diet, in which the vitamin

TABLE 3  
TYPICAL REDUCTION MENU

*Breakfast*

Orange, sliced (80)  
Graham bread, for toast (15)  
Eggs, two, scrambled  
Butter (8)  
Coffee or tea

*Dinner*

Tenderloin steak (90), with mushrooms (50)  
Cauliflower (75)  
Salad: lettuce (20), sliced tomato (80) (mineral oil mayonnaise)  
Fruit cup: grapefruit (40), pineapple (40)  
Skim milk (150)

*Supper*

Cottage cheese (60)  
Spinach (75)  
Salad: chicken (30), celery (50), lettuce (50)  
Strawberries (70)  
Skim milk (150)

NOTE: Carbohydrate, 60. Protein, 72. Fat, 40. Calories, 888. Vitamins, adequate. Minerals: Ca 0.88. P 1.16. Fe 9.916.

content is sufficient and the minerals are adequate (as stipulated in Table 3), does not necessitate the incorporation of the mineral salts and the vitamin supplements that are necessary whenever the caloric intake falls below 800, such as is advocated by certain groups who believe in the radical, intensive reduction efforts. One can see at a glance that it is not an impossible intake, and that it is a diet which the patient can follow for an indefinite period of time in perfect comfort.

THE case that I shall discuss is an example of what I am attempting to survey, hastily and briefly. This patient before treatment weighed 298 pounds, and at present weighs 170

pounds. There are several important factors in the regimen I suggest: namely, the patient should be satisfied with what he is getting, he should be able to carry on his work without the hunger factors, and there should be the actual oxidation of the fat where the fat is. I want to emphasize the last factor, since it is important not to reduce an individual too hastily, and to give the tissues, particularly in the adult, time to compensate in their elasticity from the oxidized flesh. Otherwise, we see a patient with a haggard, wrinkled, worn-down, wrung-out appearance.

There are a few points about this patient I should like to call to your attention. She has had two phases of her reduction program. We saw her first some fifteen years ago, at which time she weighed 298 pounds. At that time she was reduced 141 pounds to 157.

She had a hyperthyroidism with her 298 pounds and was not losing weight. I think the patient will verify that at the time we had some interesting discussions with Dr. Henry Plummer, now deceased, who refused to proceed with the recommendation of thyroidectomy at that time because of the 298 pounds and other factors which were not compatible with the ordinarily expected clinical signs and symptoms of hyperthyroidism. Nevertheless, after considerable persuasion Dr. Pemberton removed the thyroid and we proceeded with the reduction to 157 pounds.

One interesting thing is that, at the age, I believe, of 35 or 36, never having been pregnant and having had but three menstrual periods in her life to that point, she promptly became pregnant and has a very healthy young daughter who is around 12 or 15 years old now.

The second point about this patient that I should like to emphasize is that following the development and approach of the menopause phase, which came into the picture approximately two or three, possibly four years ago, there was a gradual return to the weight of about 254 pounds in her second episode. We have now reduced her weight to 170 pounds.

I want you to note the patient's reaction to a few questions that I shall ask her.

DR. BARBORKA: In the first place, I should like you to tell the audience what you think of the rigid regimen you followed. Have you felt, through those many months of a gradual reduction, hunger or starvation?

THE PATIENT: No.

DR. BARBORKA: What has been the feeling?

THE PATIENT: I am getting too much food.

DR. BARBORKA: That statement has always interested me, because with the type of reduction we suggest, giving the quantitative amounts that I outlined a moment ago, these patients invariably will tell you, "Doctor, I am getting too much food. This is more than I eat in the sense of satiety or satisfaction." That is very comforting to the doctor, because I quite admit that when you glance at the proportions of restriction, you might think, "How are we going to get along with that amount of food?" This patient not only got along with that amount of food but carried on a very active life in her home.

Secondly, I wonder whether or not at this stage you feel you can carry through and not become careless again, or are you tempted?

THE PATIENT: Never.

DR. BARBORKA: Is that second resolution going to hold

THE PATIENT: That's right.

DR. BARBORKA: There are one or two more points that I should like to discuss, namely, the collateral or adjunct therapy that we might consider justifiable in stimulating metabolism. I think perhaps we can say two things may be justified, and occasionally a third. They are, first, exercise, which is perfectly logical, and, second, cold baths when there is no cardiovascular disease to contraindicate such baths.

A third point is open to question and involves the consideration primarily of three

drugs. The first is thyroid. Many of you are familiar with the fact that Naunyn would give 10, 15, 30 grains of thyroid per day; his method of observing whether that was toxic was merely to see the patient, seat him for a few moments, and, if the pulse did not exceed 90, carry on. I admit that that amount of thyroid probably would give the doctor a very dramatic result, but I fear for the collateral involvement from such procedures. We never use thyroid except in cases in which there is obvious evidence of associated hypothyroidism or a normal metabolism, but with a slow pulse, low blood pressure, sluggishness, dry skin, or other factors suggestive of its justification. There may be a phase where there is a remission from reduction, and, as we know, there is always a step-like fall of little ups and downs. We never weigh every day; we weigh only at a similar time and under similar conditions once a week, because of those fluctuations.

I am bitterly opposed to even the thought of dinitrophenol and I do not use benzedrine or other factors in an effort to curb the appetite and produce euphoria. These drugs are not necessary, as the case I have presented reveals, if the proportionate intake is enough to maintain the intermediary burning processes in a protective sense.

There are still many factors that are not clear and I merely briefly mention two or three points that we must learn more about. First, why in certain cases does fat accumulate selectively in certain regions of the body? Why is the fat of lipoma so resistant to the withdrawal during starvation methods? Third, why in starvation is there so much greater loss of fat from the upper half of the body rather than from the fat of the thighs or the buttocks where there seems to be such a universal predisposition.

## Traumatic Neuroses

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IT MAY seem strange for a man whose field is traumatic surgery in general to discuss the subject of traumatic neuroses. However, it is not so strange when one realizes how great this problem of neuroses has become. It now impinges upon every specialty and affects the general practitioner, the general surgeon, and the internist.

As Medical Director of the New York City Transit System, I am well aware of the great problem it has been to fit men back into their former jobs. Regardless of whether a discharged soldier is physically or mentally incapable of going back to work, the law requires us to give him back some job, and it should. Therefore, in discussing this subject I am drawing on the knowledge gained from my private practice and also from my contacts with returning soldiers.

Traumatic neuroses are so-called functional disturbances of the nervous system. They are frequently encountered in trauma, but not less often in nontraumatic and even in medical conditions. A great many people think that the prefix "traumatic" should not be used at all because these neuroses may result from so many other conditions, but this name has existed for

such a long time that I don't think anybody can change it.

The symptoms are very diverse. Years ago, as far back as 1874, there was another name for it. It was called "railroad spine" and it was thought to be typical of railroad accidents; particularly rear-end collisions in which the man would be jarred and his back would be hurt so that he had a set of symptoms related to his back. It also was known as Erichsen's disease, and for years it has been called the American disease because our people for some reason or other have been very prone to it.

All sorts of extreme views have been entertained in regard to this condition. Some people say it is an entity of its own, and a very severe thing; other people say that there isn't any such thing—it is created, it is due to suggestion, it is due to litigation it is due to "compensationitis," or it is manufactured for the purposes of a lawsuit.

Don't take either of those extreme views; the condition does exist. It occurs in all races; it occurs at all ages; it occurs as the outcome, sometimes, of the more trivial type of injury; it occurs very rarely as the outcome of a severe injury. I almost never have seen a man with a severe injury, not even excepting fracture of a spine or fracture of a skull, develop

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a traumatic neurosis, but I have seen a great many occur from the most trivial of injuries, even in some cases when the individual did not have a mark on his body. So then I say to you that the sights and the sounds, the narration of the occurrence, the reading of it in a newspaper, the hearing of it from somebody else, are often, in a susceptible person, just as potent an actuating cause and source as if that individual had been in a falling elevator coming down from the top of a building, or in a rear-end collision of trains in our subway tunnels in New York.

Neither the extent nor the site of the damage is any measure of the neurologic effect. There is no special part of the body which, when affected, inevitably produces a traumatic neurosis.

These neuroses are divided into two general classifications: (1) the neurasthenic, and (2) the hysterical.

**N**ow, a definition. *Neuros*: nerve. *Asthenia*: weakness. *Neurasthenia*: nerve weakness. Nerve weakness is the essence of neurasthenic, nervous instability, and incapacity for sustained effort; there may be a large group of emotional symptoms and very few objective symptoms. There are a number of names for this condition now—*anxiety neurosis*, *fear neuroses*, *escape neurosis*, *frustration neurosis*. But, part and parcel, it is just the same thing as it was years ago, motivated by the same things, based on the same nervous incapacity to "take it" under the influence of stress and strain.

What is hysteria? It is functional disease of the central nervous system which is characterized by certain essential things: First, the *stigmata*. They are the things with which the individual is born; he has always had them; he may know nothing about it until some incident or some examination brings it out. What are the *stigmata*? Mainly, areas of *hypoesthesia* or *anesthesia* distributed in various parts of the body. Where, chiefly? In cases involving the back in three places: (1) over the vertebra prominens; (2) in the middle of the dorsal region; and (3) in the lumbosacral region.

What do you find when you examine a patient with a traumatic neurosis? Let me advise you always to examine these people with the greatest possible care. Why? Because there are some objective things that are beclouded by this set of subjective symptoms. Examine your case with great care. Don't neglect it. First, the psychology of it. "Well, that doc surely went over me. If there was anything the matter with me he would have found it out."

"Doctor, I've got a pain in my back. I've got to twist over in bed and I can't sleep. If I lift or do anything it gives me a terrible crick in my back. And doctor, you know another thing that bothers me, I have a tremor; my fingers shake."

How do you reveal this tremor? Hold the patient's hand out. Is it steady? Try it again in another way. Bring his fingers together. Do they shake? Try it a third way. Take a blotting paper and hold it up in the air over the hand. Those are three tests for tremor. Has he got it?

The other thing the patient says is, "Doctor, my heart runs away with me." Has he got any *tachycardia*? When he first comes into the room, is his pulse 90 or 100 or 120? After he sits for a while, does it get down to 80 or 84?

Another thing he will say to you is, "Doctor, I sweat." Are his hands moist? Has he pads of perspiration in his axillary region?

What does he look like as he comes into your place? The attitude is sometimes very telling. Does he look like a worn, wan individual? When he comes in and sits down, is he fairly deliberate? Is he careful about this back of his? Or does he come in and sit down normally? When he takes off his shoes, does he stoop over and take them off like anybody else? You ask him to walk. Does he walk right or has he a little limp? Does he list to one side? If he does and you want to find out whether or not it is real, while he is walking say, "Walk backward." Try that walking backward test on some of your cases. That is a good one.

You have looked at him; there is your inspection. You have watched how he acts with his back. Now you are going to test him for sensation. As you go up and down his back

you take a marker and put a cross on it wherever he says it hurts and then come back and see if it hurts again. That is the relocation test. He ought to hit the target within a couple of inches on each side. Has he got it or hasn't he got it? Ask the patient to sit down. Just at the suggestion of a touch, does he say, "That hurts me. Don't do that." In traumatic surgery, in any kind of a lesion, be careful about the individual who has localized tenderness. Localized tenderness is just as pathognomonic in traumatic surgery as it is in general surgery. You know what that means. If a man says that his back hurts all over, such pain is not focal, it is general, as compared to the man who says, "There it is! There it is!" One is general and vocal and the other is local and focal. Don't be disturbed by the general and the vocal, but be awfully careful about the local and the focal; it means something. Is your relocation test positive when you mark it?

Ask him to bend forward, backward, to the right and to the left, and to swivel around, and then ask him to sit down. If he sits down and bangs up against the back of the chair, well, those local spots are not so tender after all.

**S**UPPOSE a case comes to you for examination and his story is that he hurt his arm or his leg; he is supposed to have traumatic hysteria. What are you going to look for in that type of case? This is the kind of case that will have two outstanding, major symptoms: These cases may be classified as minor hysterias and major hysterias. The major hysteria is the kind that has the convulsion, the very marked contracture, and the absolute paralytic manifestations. They are very rare now. In the hysteria minor what do you look for? What are the two outstanding things you are after? "I can't raise my arm, Doctor. It's paralyzed. And it is a funny thing, I can stick pins into it or burn it with a match, and I can't feel a thing." The individual has a paresis of his extremity and he has a paresis of his sensation, the two outstanding things that you look for in the hysteric.

The patient comes to your examining room,

this time with a paralyzed arm and a paralyzed leg. How does he enter? How does he take off his coat with a paralyzed arm? Does he shake it off both shoulders or does he take it off the good side first and then slide it off the other? Has he got a dropped wrist, or has *she* got a dropped wrist? (Neurasthenia is more common in males than in females; hysteria is more common in women than in men). If he has a dropped wrist, you should note whether or not he wears gloves. If he has gloves on to fit this deformity, those gloves ought to be in a particular set of wrinkles by this time. Or has he got a dropped foot? If he has a dropped foot, those shoes ought to be worn in a very peculiar kind of way. Are they?

Examine this patient with extreme care and test him out for his sensation. You will find that his sensation will be abolished in certain places: the glove area, like a short pair of gloves; the long glove; the shoulder area; the stocking area—so-called areas of anesthesia. Then you test him out for his muscular power. Hysterical paralysis is almost never associated with atrophy. Even though it has gone on for six or eight or ten or twelve months, the amount of atrophic disuse is entirely disproportionate to the alleged extent of the paralysis of the muscle or sensation.

Those are some of the major things. They tell me that 32 per cent of the discharges in the case of the soldiers were for such psychoneuroses. I wish they had not put the label "psychoneurosis" on these men. I wish they had called it nervous instability, because some of these poor fellows when they come back say, "Doctor, when I was in the Army, when I was in the Navy, I was a psycho," and when they come back to go into civil life again and have some accident or illness and are lying awake at night worrying about that, it will come back to them that their officer in the Army or Navy thought they were so incapable of carrying out their military duty that they were labeled "psycho-neurotic." I think they will stop that before long, just as we in World War I stopped the designation "shell shock" because the fellows

got so bad then that they used to walk in to see us and say, "Doctor, I've got shell shock."

This psychoneurosis that the men develop in the service is precisely the same thing that people develop in civil life; there is no difference whatsoever. We have found that these people in military life reveal exactly the sort of thing that they might reveal in civil life: incapacity for sustained effort, incapacity to adapt themselves to surroundings, incapacity to take it under the rigors of military life, and in some of them who have been in the battle zone, justifiable fears and terrors under battle influences and they break, exactly as they break in civil life.

There is another point I would like to make—the compensation role. Look out for the person who has some reward in view. Look out for the individual who is given as much when

he is off the job, from his compensation and from his benefit organization, as he gets when he is working; look out for the fellow that you send back to light work at his regular salary. What would you do and what would I do under the same circumstances? Be careful of "compensationitis." It is a very dangerous sort of thing.

First, examine such a patient carefully; second, reassure him as to the diagnosis; third, tell him that if he got the injury while playing football or baseball or from falling down the cellar stairs in his own house, he wouldn't be nearly as bad as he thinks he is. Tell him that the vast majority of such cases get well. If he has a claim try to get that claim settled by a lump sum adjustment, because that is one of the best ways to cure the motive and the activating factors.

## THE AGE OF AGE

"We have entered an Age of Age." In 1850, 12.6 per cent of the population was 45 years old and older; now over 26 per cent are over 45, and by 1980 over 40 per cent of the population will be of that age. Babies born this year can expect to live about 66 years; in 1850 the expectancy was 40 years. By the year 2000 about 90 per cent of all deaths will occur among persons who are over 45 years of age. Our maximum population of 153 million will be reached by 1980, when our birth and death rates will be equal.

Greater age, more old people, a changing population mean social, economic, and medical changes. Heart disease and cancer are the major causes of death today. But for every death from circulatory disease, only \$0.17 is spent for research in that field. Cancer research costs \$2.00 per death. Infantile paralysis is more dramatic, touches the heart and purse of philanthropists, who dig up \$500.00 for polio research, for every death from that disease.

## SCIENTIFIC EXHIBIT

# Longevity and Mortality of Physicians

LOUIS I. DUBLIN<sup>1</sup>, MORTIMER SPIEGELMAN<sup>2</sup>, and ROSCOE G. LELAND<sup>3</sup>

THE following charts present the results of a study showing what the men and women of the medical profession, dedicated to protect the health of others, have accomplished in protecting their own health.

The over-all picture shows that the longevity of physicians, in spite of their favored position, is practically identical with that of the general population. This summary statement, however, hides some interesting contrasts. Physicians under 45 years have a much lower death rate than the general population of the same ages, reflecting their select physical condition and their better social-economic status.

Later in life, physicians have the higher death rate. There are also marked differences in regard to causes of death. Mortality from the cardiovascular diseases is considerably greater than in the general population. On the other hand, physicians make the better showing for

those conditions in which early recognition and expert treatment can effect beneficial results. These conditions include cancer, appendicitis, hernia, peptic ulcers, and diseases of the prostate. This demonstration of the advantage of early recognition and care in the treatment of disease emphasizes an important message for the public in general.

The charts have additional values. The mortality rates throw light on the replacement needs of the profession. They also indicate the desirability of minimizing the strains and stresses of the profession so that physicians may achieve the benefits which their favorable position makes possible. From a social and economic viewpoint, the untimely death of physicians represents a serious waste because of the important service that is lost and because of the large investment involved.

### REFERENCE

DUBLIN, L. I. AND SPIEGELMAN, M: The longevity and mortality of American physicians, 1938-1942. J.A.M.A. 134: 1211-1215 (Aug. 9) 1947.

NOTE: These charts were shown in the Scientific Exhibit at the Centennial Session of the American Medical Association in Atlantic City, June 9-13, 1947.

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2. Metropolitan Life Insurance Company, New York, N. Y.

3. Chicago, Ill.

# EXPECTATION OF LIFE FOR PHYSICIANS



Present Age	Expectation of Life (Years)		Present Age	Expectation of Life (Years)	
	Men	Women		Men	Women
25	43.5	47.1	50	21.5	24.7
26	42.6	46.2	51	20.7	23.9
27	41.7	45.2	52	20.0	23.1
28	40.7	44.3	53	19.2	22.3
29	39.8	43.4	54	18.5	21.5
30			55	17.9	20.7
31	38.9	42.4	56	17.2	19.9
32	37.9	41.5	57	16.6	19.2
33	37.0	40.6	58	15.9	18.4
34	36.1	39.6	59	15.3	17.7
35	35.1	38.7			
36			60	14.7	16.9
37	34.2	37.8	61	14.1	16.2
38	33.3	36.9	62	13.6	15.4
39	32.4	35.9	63	13.0	14.7
40	31.5	35.0	64	12.4	14.0
41	30.6	34.1			
42			65	11.9	13.3
43	29.7	33.3	66	11.3	12.6
44	28.9	32.4	67	10.8	11.9
45	28.0	31.5	68	10.3	11.2
46	27.2	30.7	69	9.9	10.6
47	26.3	29.8			
48			70	9.4	10.0
49	25.5	28.9	71	8.9	9.5
50	24.7	28.1	72	8.5	9.0
51	23.8	27.2	73	8.0	8.4
52	23.0	26.4	74	7.6	8.0
53	22.3	25.5			

Based upon the records of living physicians and the deaths of active and retired physicians for the period 1938-1942 on file with the American Medical Association

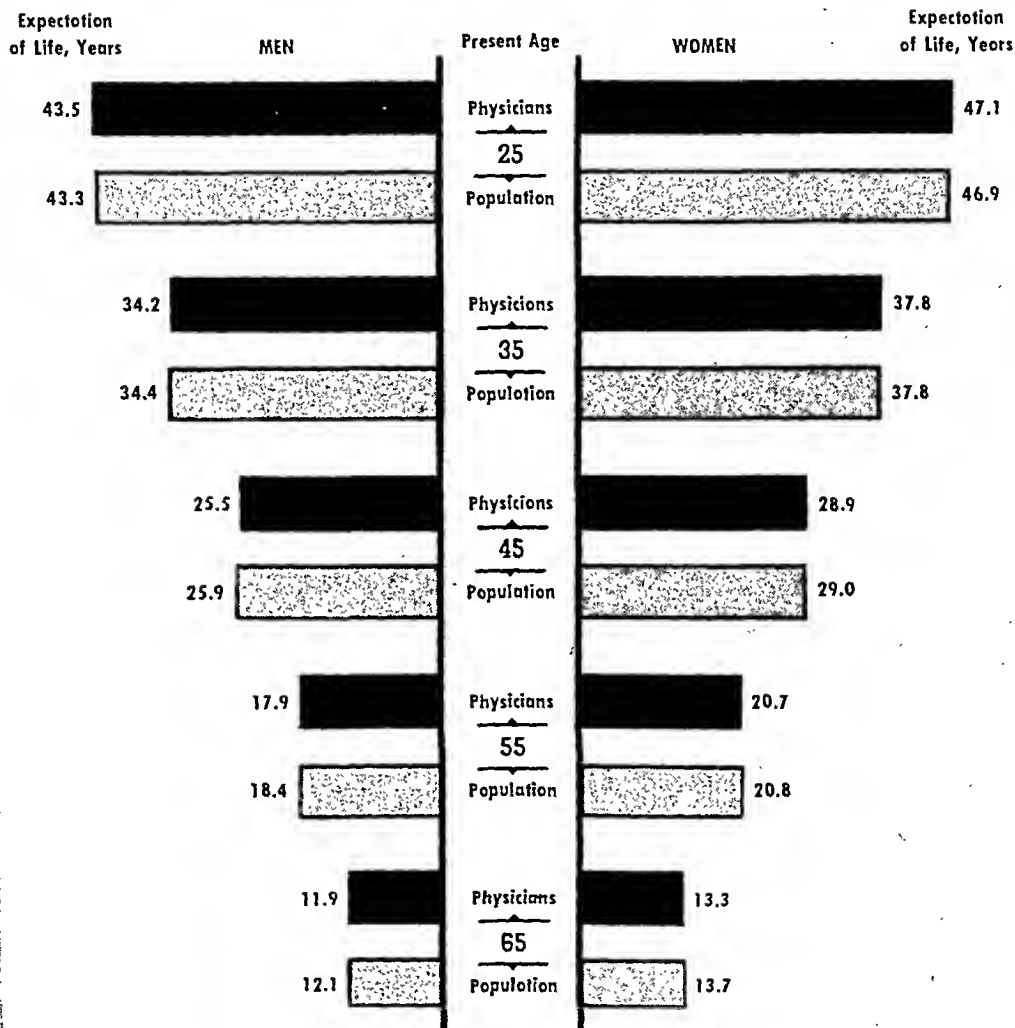


# EXPECTATION OF LIFE



## PHYSICIANS AND GENERAL POPULATION

Young physicians have only a slightly greater expectation of life than the general population. By mid-life, this small advantage is lost.



Population data relate to white persons only

Experience of 1938-1942



# ALL CAUSES OF DEATH



The mortality of physicians under age 45 has decreased sharply from 1925 to 1938-1942; the changes after age 45 have been relatively small.

Age	Deaths per 100,000 Male Physicians		Percent Change from 1925 to 1938-1942
	1938-1942	1925	
25 and over	2,053	2,118	-3
25 to 44	283	451	-37
45 to 64	1,886	1,809	+4
65 and over	7,260	7,352	-1

Experience of 1925 from Emerson and Hughes, American Journal of Public Health, 1926



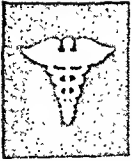
Recent death rates of physicians are lower than in the general population at ages under 45; at the higher ages, the death rates of physicians are the greater by a small margin.

Age	All Causes Deaths per 100,000 Males		Mortality Ratio: Physicians to White Males
	Physicians	U.S. White	
25 and over	2,053	2,022	1.02
25 to 44	283	385	.74
45 to 64	1,886	1,759	1.07
65 and over	7,260	7,074	1.03

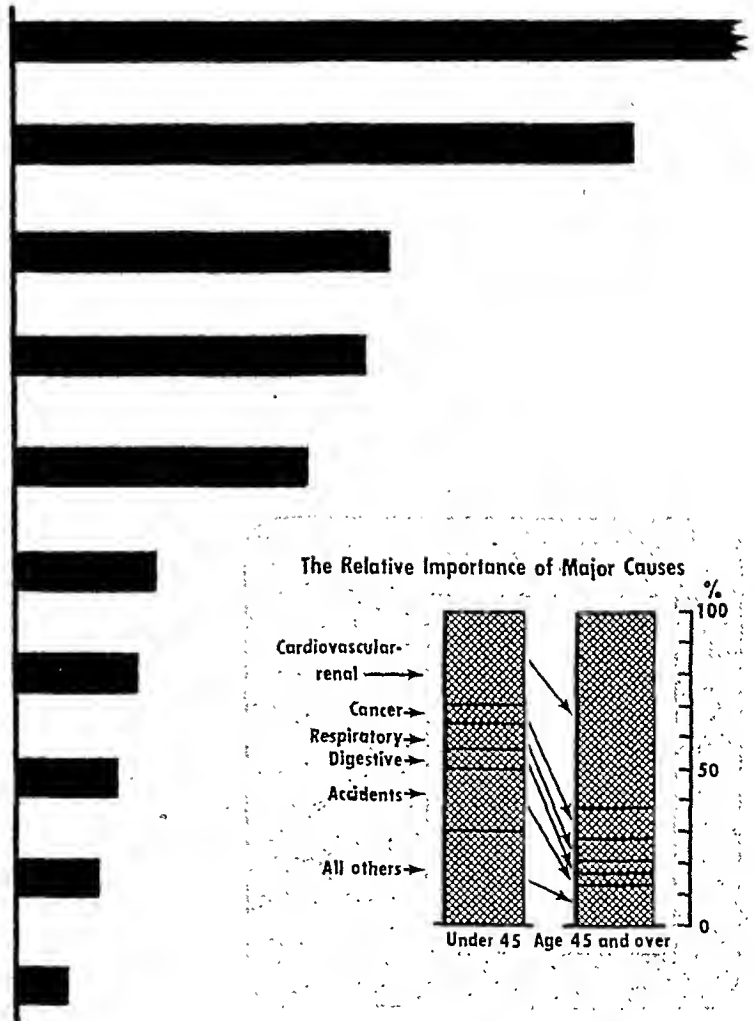
Experience of 1938-1942

Death rates for physicians in 1925 and for the general population adjusted to the age distribution of male physicians in 1940

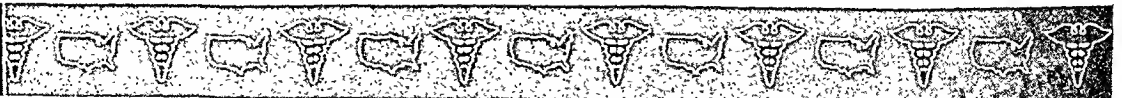
# TEN LEADING CAUSES OF DEATH



Rank	Cause of Death	Percent of Total Deaths
①	Diseases of the heart and blood vessels	54.0
②	Cancer	9.7
③	Nephritis	5.9
④	Pneumonia and influenza	5.5
⑤	Accidents	4.6
⑥	Diabetes mellitus	2.2
⑦	Suicide	1.9
⑧	Tuberculosis	1.6
⑨	Cirrhosis of the liver	1.3
⑩	Diseases of the prostate	.8
All other causes		12.5
Total deaths		100.0



Experience among male physicians, 1938-1942

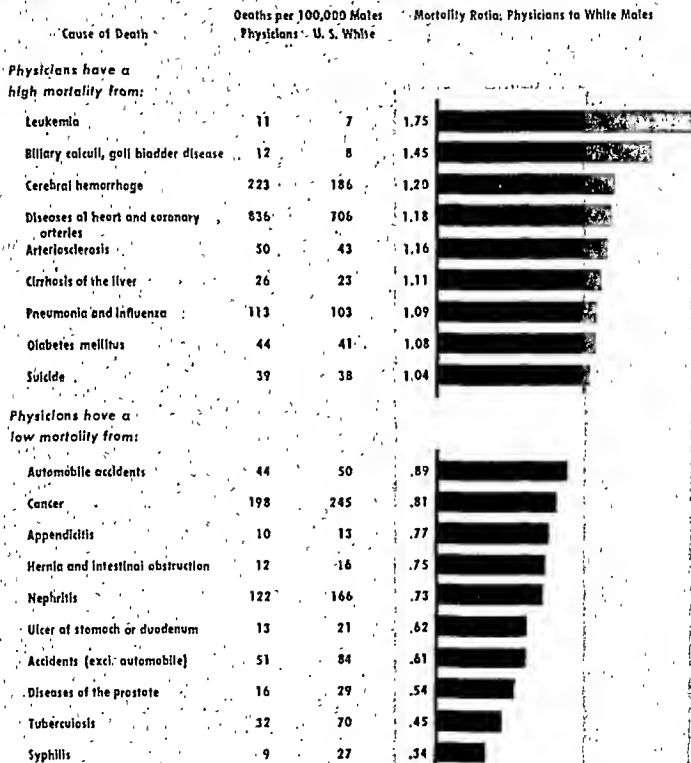


# CAUSES OF DEATH



## PHYSICIANS AND GENERAL POPULATION

Physicians have higher death rates from the degenerative diseases than the general population, but much lower death rates from most infectious diseases and surgical conditions.



General population death rates adjusted to the age distribution of male physicians in 1940

Experience of 1933-1942

# CARDIOVASCULAR-RENAL DISEASES

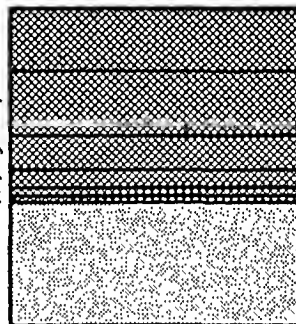


These closely related degenerative diseases account for 60 percent of the total deaths among male physicians.

60% {

- Coronary diseases 20%
- Other heart diseases 20%
- Cerebral hemorrhage 11%
- Chronic nephritis 6%
- Arteriosclerosis 2%
- Others of this group 1%
- All other causes of death 40%

Distribution of Diseases Within the Cardiovascular-renal Group

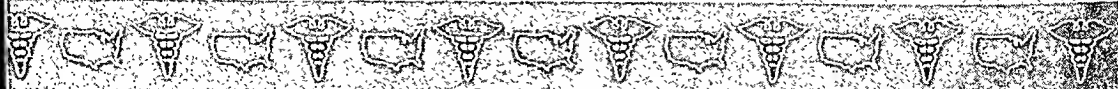


The death rate from this group of diseases among physicians of all ages is 12 percent higher than in the general population.

Age	Cardiovascular-renal Diseases Deaths per 100,000 Males		Mortality Ratio: Physicians to White Males	
	Physicians	U. S. White		
25 and over	1,225	1,090	1.12	
25 to 44	85	82	1.04	
45 to 64	1,132	847	1.34	
65 and over	4,547	4,371	1.04	

General population death rates adjusted to the age distribution of male physicians in 1940.

Experience of 1936-1942



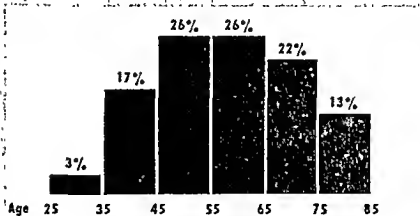
# DISEASES OF THE CORONARY ARTERIES



At the ages of greatest productivity, from 45 to 65, one death in every four is due to diseases of the coronary arteries.\*

## Deaths from Diseases of the Coronary Arteries\*

Percent of Total Deaths Among Male Physicians  
According to Age



Compared with the general population, the death rate from these diseases among physicians is the higher by more than 80 percent. Much of this excess mortality may be due to better diagnosis.

## Diseases of the Coronary Arteries\*

Age	Deaths per 100,000 Males		Mortality Ratio: Physicians to White Males	
	Physicians	U. S. White		
25 and over	413	228	1.82	
25 to 44	36	25	1.44	
45 to 64	489	260	1.88	
65 and over	1,287	715	1.80	

\*Including angina pectoris

General population death rates adjusted to the age distribution of male physicians in 1949

Experience of 1922-1942

# CANCER—ALL SITES



Cancer ranks high as a cause of death among physicians from age 45 upwards.

Rank by Age

35 to 44

45 to 54

55 to 64

65 to 74

75  
and  
over

1st	2d	3d	4th
			↓
	↓		
		↓	
		↓	
		↓	



The death rate from cancer among physicians is far below that of the general population. This is probably due to better opportunities for early diagnosis and for prompt and expert treatment.

Cancer, All Sites  
Deaths per 100,000 Males  
Physicians U. S. White  
Mortality Ratio: Physicians to White Males

25 and over

198

245

.81

25 to 44

16

24

.67

45 to 64

177

238

.74

65 and over

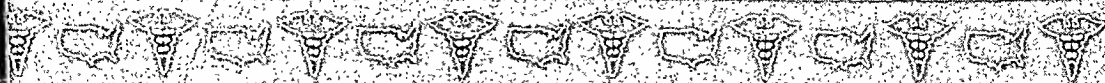
744

864

.86

General population death rates adjusted to the age distribution of male physicians in 1940

Experience of 1938-1942

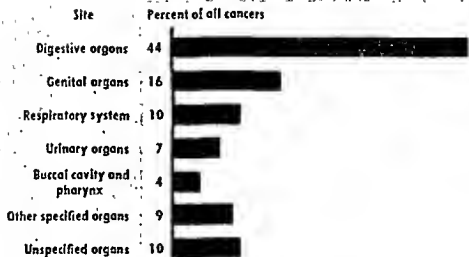


# CANCER BY SITE

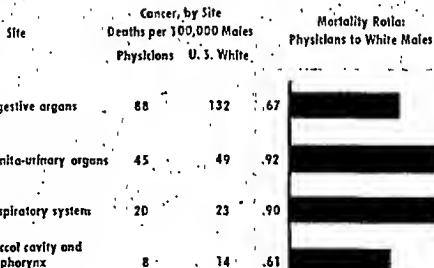


The digestive organs are by far the most frequent sites of cancer in male physicians; cancers of the genital organs rank next.

Fatal Cancers According to Site



The death rate from cancer for each of the important sites is lower among physicians than among white males generally.



General population death rates adjusted to the age distribution of male physicians in 1940

Experience, 1931-1942

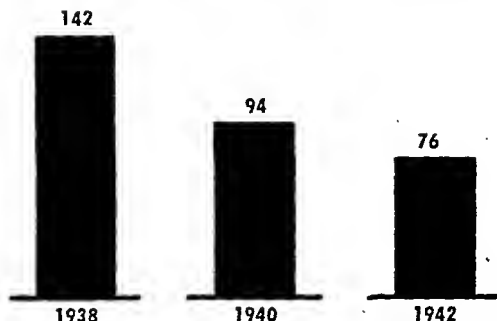


# PNEUMONIA AND INFLUENZA



The importance of pneumonia and influenza as causes of death among physicians has decreased rapidly in recent years.

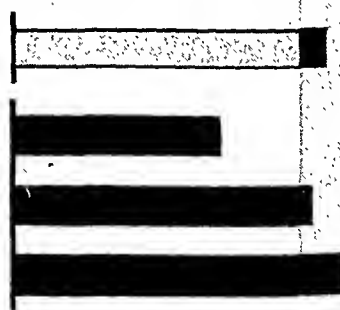
Pneumonia and Influenza  
Deaths per 100,000 Physicians



The death rates among physicians from these diseases are low when compared with the general population up to mid-life; after that, physicians have the higher rates.

Pneumonia and Influenza  
Deaths per 100,00 Males  
Physicians U. S. White  
Mortality Ratio: Physicians to White Males

Age	Physicians	U. S. White	Mortality Ratio: Physicians to White Males
25 and over	113	103	1.09
25 to 44	16	22	.73
45 to 64	86	82	1.05
65 and over	433	370	1.17



General population death rates adjusted to the age distribution of male physicians in 1940

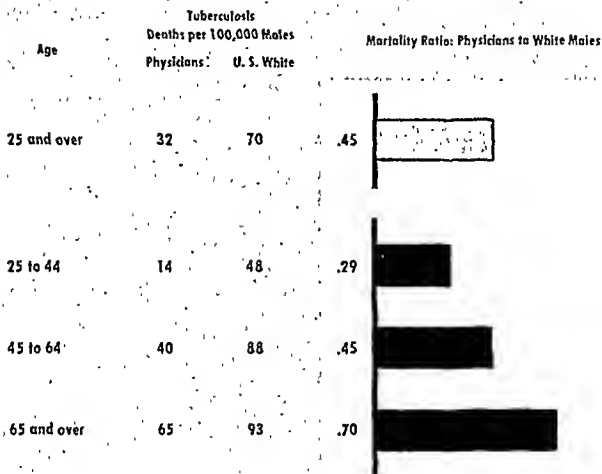
Experience of 1938-1942



# TUBERCULOSIS



Mortality from tuberculosis among physicians is less than one half that of the general population:



Only 20 percent of all deaths from tuberculosis among physicians are at ages under 45. At these ages their death rates are little more than one fourth those of the general population. The peak of the tuberculosis rate for physicians is now past age 65.

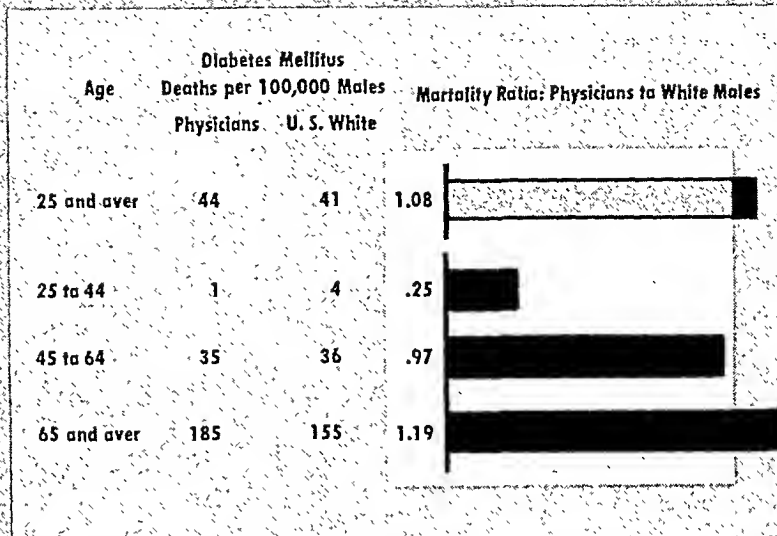
General population death rates adjusted to the age distribution of male physicians in 1940

Experience of 1938-1942

# DIABETES MELLITUS



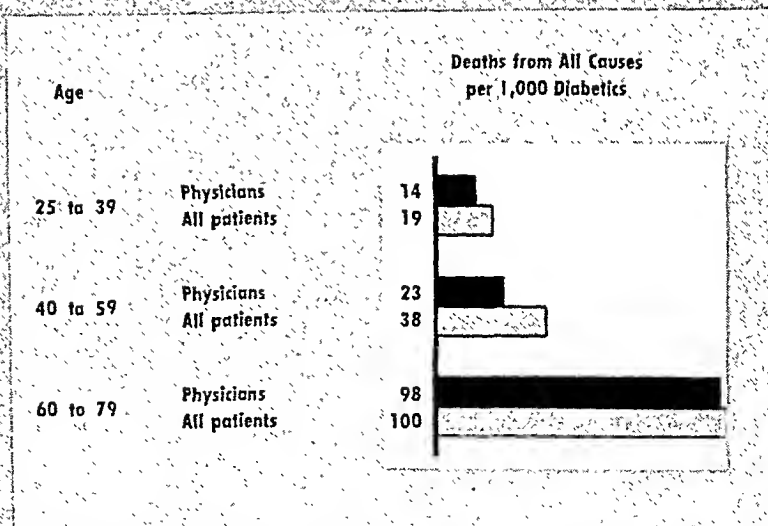
The death rate from diabetes among physicians under 65 is lower than in the general population. This probably reflects earlier diagnosis and better knowledge for treatment. Among older physicians, their higher mortality may indicate more frequent recording of the disease.



General population death rates adjusted to the age distribution of male physicians in 1940

Experience of 1938-1942

The advantages of early diagnosis and better treatment are also evident in the lower death rates from all causes among diabetic physicians compared with diabetics generally.



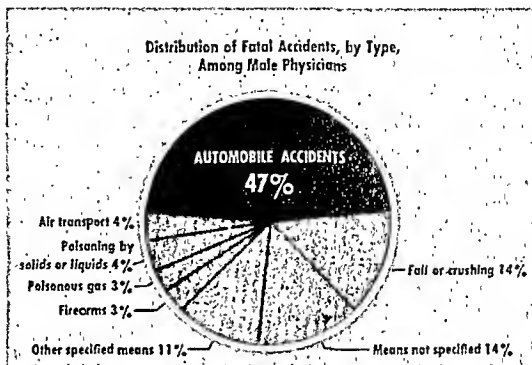
Experience of the George F. Baker Clinic from the beginning of the Insulin era, 1922, through 1938



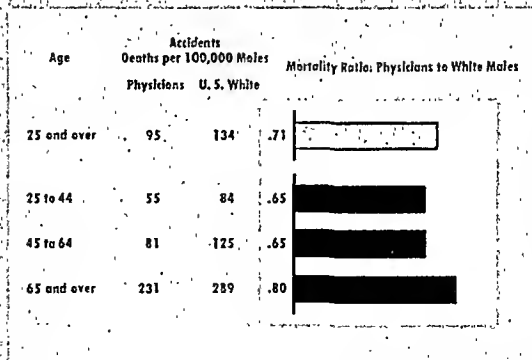
# ACCIDENTS



Automobile accidents cause almost half of the accidental deaths among physicians.



The death rate from accidents for physicians is much lower than for white males generally at every age.



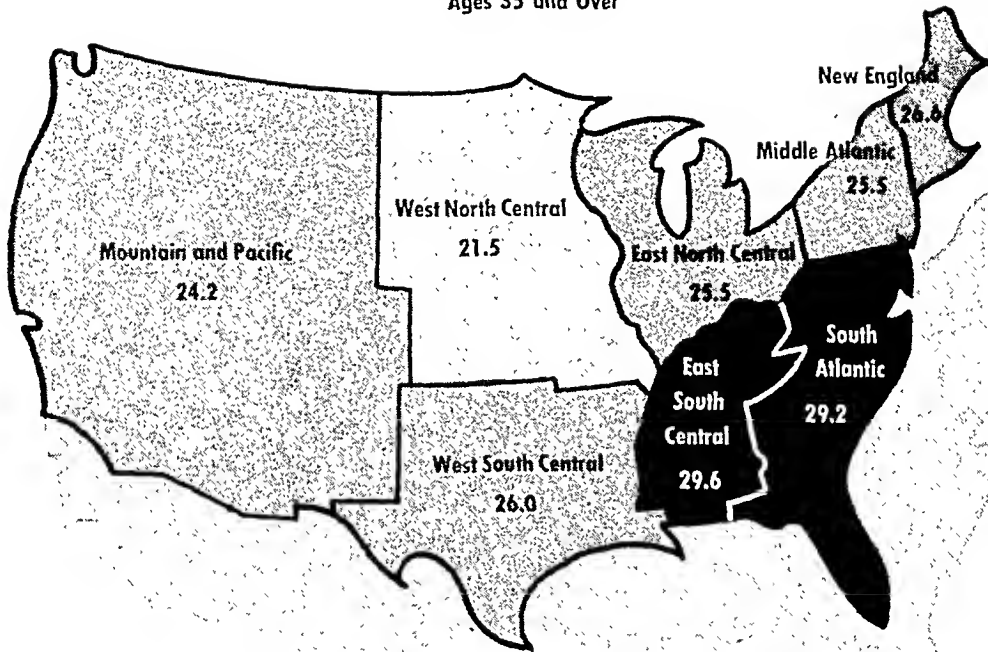
General population death rates adjusted to the age distribution of male physicians in 1949.

Experience of 1935-1942

# GEOGRAPHIC VARIATIONS IN MORTALITY



Deaths per 1,000 Physicians  
Ages 35 and Over



The death rates are lowest among physicians in the Northern States of the Midwest and highest among those in the Southeastern States. This geographic variation in mortality conforms closely with that of the general population.

All death rates adjusted to the age distribution of male physicians in the total United States in 1940

Experience of all physicians, 1939-1941



## Manifestations of Liver Disease

FROM NICHOLS VETERANS ADMINISTRATION HOSPITAL\*

HAROLD GORDON, M.D., EDITOR

## CLINICAL ABSTRACT

THE patient, a thirty-four-year-old white male, first showed signs of illness in January 1944, when he developed nausea without vomiting. In October 1944, he attended sick call because of a "heavy" feeling and soreness in the epigastrium. A G.I. series is said to have been negative, so he did not report sick again, although his symptoms continued. In April 1945, he became jaundiced, again had "indigestion," and felt as if his "stomach was hard in the solar plexus region." This was followed by itching, which gradually spread over his whole body. In June 1945, after taking a laxative, he had clay-colored stools. This condition lasted three months. At this time his icterus index was 49, but fell to 20 after a course of penicillin. Two stools were clay-colored and were negative for bile and bile acids. X-ray examination of the gallbladder and gastrointestinal tract was negative and he had a normal glucose tolerance curve.

The patient lost 30 pounds and had 3 to 5 watery stools daily. The stools contained mucus but no blood or pus cells. From June to September 1945, he had chills almost daily with cold sweats lasting about half an hour. He was transferred to Great Lakes U. S. Naval Hospital July 20, 1945, and was discharged totally disabled September 21, 1945, with a diagnosis of chronic hepatitis.

On January 3, 1946, he consulted a doctor because of nausea and vomiting, general malaise,

pallor, and weakness. He had a pale yellow color and an enlarged liver (to within 3 finger breadths of the umbilicus). The stools were strongly positive for occult blood, but cultures for typhoid, paratyphoid, and dysentery bacilli, were negative. Repeated searches failed to reveal any amoebas or parasites. The Van den Bergh test was positive, direct. Smears of the blood were negative for malaria parasites. His blood Kahn was negative. Red blood count was 3.46 million; Hemoglobin was 10.5 gm. per 100 cc.; white blood count was 6,200 with normal differential. The urine had a trace of albumin, and was negative for sugar and red blood cells.

On January 23, 1946, he had severe hematemesis with shock. He was transfused and given vitamin K. He ran a septic temperature for ten days, during which time penicillin and sulfadiazine were given. Concomitantly he had diarrhea. Proctoscopic examination and mucosal scrapings did not show any abnormalities. Routine stool examinations were continued, since he had diarrhea, with 3 to 6 watery stools daily. The hemorrhage was attributed to esophageal varices. He improved and was discharged, with instructions to follow a low fat, high protein, high carbohydrate, high vitamin diet. Prolonged bed rest and the administration of intrahepatol (Lederle) intravenously (34 doses) improved the patient's condition. Treatment was discontinued because it was expensive and no change was noted in the size of the liver. Meonine (de-methionine Wyeth) was given for six weeks with no significant clinical change.

An exploratory laparotomy was done June 12, 1946. The liver was enlarged, particularly the right lobe, which extended down to the iliac crest.

From the Departments of Medicine, Surgery and Laboratory Service, Nichols Veterans Administration Hospital, Louisville, Kentucky.

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The portion of liver lateral to the gallbladder had an appearance characteristic of fatty degeneration and passive congestion. The surface was smooth and symmetrical. The portion medial to the gallbladder was pink in color, granular, and filled with firm nodules varying from 2 mm. to 3 cm. in diameter. The tissue between the nodules was soft. Grossly, this portion had the characteristics of primary neoplasm.

After the operation the patient became weaker and was in about the same condition as when he was first seen by his doctor in January 1946. He resumed daily activity of from four to five hours; he remained on iron and vitamin therapy and on a high carbohydrate, high vitamin, high protein, high caloric, low fat diet.

HE WAS seen at Nichols as an outpatient on November 12, 1946. His physical status was about as indicated above. Total protein, 7.55; albumin, 2.31; globulin, 5.24; axiokingival ratio, 0.44/1. Cephalin flocculation, 0/0. Prothrombin time, 26 seconds (56 per cent normal); control, 18½ seconds. Red blood count was 4.34, with 13 gm. of hemoglobin. Crude liver extract was prescribed, together with choline, methionine, and vitamins, iron, high carbohydrate, high protein, high caloric, low fat diet.

He was admitted to this hospital November 16, 1946, complaining of having vomited approximately one-half cup of bright red blood early that morning. On physical examination he had a weak pulse, 132. His blood pressure was 104/80. He was pale and sweating. There was a slight icteric tinge to the scleras. The heart and lungs were negative. The abdomen was enlarged on the right. The liver was enlarged 5 fingers below the right costal margin, and felt nodular to palpation. There was a small amount of ascites present.

*Course*—Shortly after admission he vomited about 100 cc. of bright red blood. His red blood count was 3.15, with 10 gm. hemoglobin. He was given 1000 cc. of whole blood, vitamin K, and sedation. The next morning he again had hematemesis, and his red blood count was 2.09; his icteric index was 18. Prothrombin time was 34 seconds; control, 18 seconds. He was kept sedated.

His blood pressure and pulse remained constant until he died suddenly.

#### DISCUSSION

DR. MALCOLM THOMPSON (Senior Consultant, Surgery): Two or three things stand out in this history. First, the patient's illness was prolonged, starting in January 1944. Second, he had very few well days during his illness. Third, practically all the signs and symptoms were referred to the gastrointestinal system, most of them to the liver and the biliary tract. So, in attempting to arrive at a diagnosis, we must consider conditions in the right upper abdomen, particularly the liver, which were likely to produce the symptoms and signs indicated.

We can eliminate diseases of the gallbladder because a cholecystogram showed a normally functioning gallbladder and also the operation in June 1946, disclosed no abnormalities of the gallbladder or the extrahepatic bile ducts. One or two things stand out in this abstract. One is, there is no record of a Kahn or Wassermann test on the blood.

DR. GORDON: The Kahn test was negative.

DR. THOMPSON: That is exceedingly important, because syphilitic hepatitis must be kept in mind when we consider diseases of the liver. There is another omission we should note. The patient was in this hospital only about forty-eight hours, and during all that time he was almost at the point of death. Under such circumstances it is our duty to do everything possible to restore a patient to health or at least to bring him every comfort our science and art permits. That means doing what is clearly at hand, even if it involves postponing a complete workup. I see no record here of an x-ray of his chest. In this case, perhaps, that was not important. It certainly would not have changed his status. But it often is important and may prevent a needless operation. A Kahn or Wassermann test on the blood and an x-ray of the chest should be used as screen tests, exactly as we use routine blood counts and urinalyses. It is no excuse to say that patients cannot afford the added expense. As long as we can spend millions for other things, we can afford such important diagnostic aids.

THIS history, then, indicates that he had some sort of liver disease in January 1944, with a recurrence in 1945. He had the symptoms that go with infectious hepatitis and he had jaundice and a high icterus index. He was discharged from the Navy with a diagnosis of chronic hepatitis, so his acute infectious hepatitis had become chronic. I am unable to interpret satisfactorily the statement that his "stools were strongly positive for occult blood." Some tests for blood are extremely sensitive, so we need to know what test was used. However, he also had a low red

blood cell count, so he may have been bleeding into his gastrointestinal tract even that early. If so, the bleeding was secondary to the hepatitis. Bleeding from esophageal or gastric varices and other parts of the body is common in severe hepatitis. In January 1946, he had severe hematemesis and shock. Judging from the treatment given, I would say that his doctor must have decided that the patient had chronic hepatitis.

The agglutination tests are not significant, except in so far as they tend to exclude certain conditions. The septic temperature, lasting ten days, probably was due to hemorrhage into the gastrointestinal tract. We commonly see that in bleeding duodenal ulcers. He may also have had necrosis of the liver, which would account for his fever. In view of the total and differential white blood cell counts, I feel we can exclude pyogenic infections, especially abscess of the liver. He received a high protein diet. Mann has shown experimentally that a very high protein diet sometimes is harmful after injury to the liver. However, he apparently improved symptomatically, though careful analysis indicates that the improvement was more apparent than real.

In June an exploratory laparotomy was performed. I might add here that Dr. Gordon kindly informed me that the biopsy report was misleading and is not included in the abstract. I feel very definitely that a clinicopathologic conference should not be a guessing game. All pertinent information should be included.

This man had a large liver. The portion medial to the gallbladder was pink in color, granular, and filled with nodules varying from 2 mm. to 3 cm. in diameter. The tissue between the nodules was soft. This portion, grossly, had the characteristics of a primary neoplasm.

We have reached the point where we may attempt to make a diagnosis. I think this man had a primary neoplasm of the liver, a hepatoma, grafted upon chronic hepatitis. Well over 50 per cent of primary carcinomas of the liver are grafted upon a preceding hepatitis. I purposely avoid the term "cirrhosis." I believe that within the next ten years the word cirrhosis will be used less and less, acute and chronic hepatitis more and more. Primary carcinoma of the liver usually is multicentric. It tends to spread through the hepatic vein, so that even when it starts as a single nodule, other foci are formed in the liver by way of the hepatic radicles.

The marked decrease in albumin, with elevation of the globulin and reversal of the A/G ratio, fits in with chronic hepatitis. I am unable to explain the negative cephalin flocculation test—I would have expected a 4/4 result. The prothrombin time and the other tests fit in well. The anemia and the lowered blood pressure probably were secondary to the hemorrhages he had. I believe that if he had been in this hospital longer, we would have had certain valuable

additions to the history. A history of the diet, particularly the intake of proteins and vitamins, is important in attempting to evaluate disorders of the liver. We would like to know about the use of alcohol, because alcohol predisposes to certain forms of hepatic disease. Certain medications, especially arsenic, tend to cause hepatitis.

Primary cancer of the liver is rare. In one series of 3,000 consecutive autopsies, there were only 13 primary carcinomas of the liver. The cancer may arise from liver cells or from bile ducts. Both may produce secondary nodules in the liver, owing to spread through the blood vessels. Most of the reported cases arose in association with an underlying hepatitis, but the relationship is not always clear.

CANCER of the liver may be revealed in one of four general ways. In one group the illness lasts only a few days and death is due to hemorrhage, the diagnosis usually being established post mortem. In a second group the patients are ill with hepatitis or some other disease, and the cancer is latent. A third group—in which this man seems to fit—has the usual history of chronic hepatitis, terminating rapidly with hepatic tumor, jaundice, ascites, and cachexia. The fourth group has a history pointing from the first to malignant tumor of the liver; this type develops rapidly in previously well persons. Among the more common complications of chronic hepatitis are hemorrhage from esophageal or gastric varices, intercurrent infection, tuberculous peritonitis, and portal thrombosis.

DR. GOTT (Chief of Medicine): I happened to be present the Sunday this patient was admitted. He presented signs of shock from loss of blood. Our first efforts were directed to restoring him and controlling the hemorrhage. Later he had another massive hemorrhage and died of the effects. We were impressed from the start by the enormous liver, but in this case the enlargement was obvious, and could be seen simply by observing the abdomen.

I leaned toward a diagnosis of recurrent hepatitis with some portal obstruction and hemorrhage from esophageal varices. However, the size of the liver was such that we suspected a neoplasm in addition. I have seen two cases of primary neoplasm of the liver and in both the liver was markedly enlarged. Consequently, when I see a patient with marked enlargement of the liver, I think of neoplasm.

The question has been raised as to the value of a high protein diet in this type of case. I think it is well to restrict the protein intake during the early phase of hepatitis, at least for a few days, and then provide a simple excess. Recent clinical work seems to have established the value of a high protein diet. The mechanism of this is not yet apparent, but the facts seem to be well established. It will take time to



establish whether it is the high protein diet per se or some unknown factor in the diet which is effective. Here we use a high protein diet supplemented with vitamins and liver extracts for our cases of infectious hepatitis.

DR. HAMILTON (Chief of Surgery): I would like to raise the point that if this man had not been explored, the diagnosis of malignant disease of the liver would have been very difficult. The patient's liver was unusually large and very nodular; nonetheless, a liver which feels nodular when palpated through the abdominal wall may be almost smooth when seen at operation. It is interesting also to speculate when this cancer started. Did it extend over a period of three years?

DR. GORDON: Dr. Hamilton's question cannot be answered with certainty. Cancer of the liver, like other malignant tumors, grows at different rates in different individuals and at different rates even in the same person. I don't believe this man had cancer at the start of his illness. I think he had acute infectious hepatitis and later developed cancer. I don't think the cancer was due to the hepatitis, but merely was incidental to it.

I base that opinion upon certain known facts with regard to neoplastic diseases. It is pretty well established, experimentally, that carcinogens have to operate over a considerable period of time before neoplasms develop. So far as I know, there is no exception to the general rule that malignant neoplasms have a latent evolutionary period and that a carcinogen merely initiates the process. Once the stimulus has been allowed to operate long enough, the cancer develops even though the stimulus be withdrawn. The latent period, where known, is a long one. I think this man had cancer when he was operated on, some months before he was seen in our hospital. I don't believe he had had this hepatitis long enough, by then, for it to be a causal factor.

There is another important reason against such an etiologic association. As Dr. Thompson told us, primary carcinoma of the liver may arise from the liver cells or from the bile ducts. Duct carcinoma is the more common and almost invariably is accompanied by evidence of a preceding, long-continued cirrhosis. This man had liver cell carcinoma and no significant evidence of bile duct regeneration.

THIS is the largest liver I recall seeing. It weighed almost 7 kilos—about four and a half times the average normal size. He had several metastases in the lungs, some of which were large enough to have shown up in x-rays of the chest. Had there been time for that, the diagnosis would have been established with reasonable certainty; thus Dr. Thompson's statement concerning the value of x-rays of the chest as a screen test is well substantiated in this in-

stance. The patient also had metastases in several of the mediastinal and periportal lymph nodes. The liver itself was almost wholly replaced by carcinoma.

#### *Clinical Diagnoses*

Infectious hepatitis, recurrent, chronic, active.  
Esophageal varices with massive hemorrhage.  
Possible cancer of the liver.

#### *Dr. Thompson's Diagnoses*

Carcinoma of the liver.  
Chronic hepatitis.  
Hemorrhage from esophageal or gastric varices.

#### *Miscroscopic Diagnoses*

Carcinoma of the liver, hepatocellular.  
Metastases to the lungs, mediastinal and periportal lymph nodes.  
Esophageal varices, with rupture and massive hemorrhage.  
Icterus.

RESIDENT: How do you account for the negative cephalin flocculation test?

DR. GORDON: Dr. Moore covered that neatly in a recent conference. You will recall that he said we use certain tests routinely in suspected disease of the liver. When the results correlate with the clinical findings, that is fine. When they don't correlate, we should not be led astray. No single negative test proves anything, and if a particular test yields results which are out of line, those results, in Dr. Moore's words, should be "thrown out of the window."

RESIDENT: How much hepatitis did the patient have at autopsy?

DR. GORDON: Almost the entire liver was replaced by carcinoma, which masked the hepatitis.

RESIDENT: Might not the extensive replacement of liver tissue explain the negative cephalin flocculation test?

DR. GORDON: I prefer to hold the view that the cephalin flocculation test is almost human in its ability to make mistakes. The test is far from infallible, and, as far as I know, is purely empirical.

RESIDENT: The biopsy removed at the time of his operation was reported as showing cirrhosis. We were led astray by that report. How do you account for that diagnosis?

DR. GORDON: That is not so difficult as it sounds. It is barely possible that he did not have a cancer at that time, though I think that he did. It is possible that the surgeon did not remove a representative piece of tissue. In that case the mistake should be charged to the surgeon, not to the pathologist. It is possible that the pathologist made a mistake. Pathologists are human and should not be expected to have a perfect batting average all the time. It is possible that the biopsy was small and crushed, owing to technical difficulties encountered during the operation. I'm not sure to whom that error should be charged, unless, perhaps, to the patient for lack of cooperation.

# EDITORIALS

## SICKLE CELL ANEMIA

**S**ICKLE cell anemia, a disease generally considered comparatively rare, has attracted a great deal of study. For many years this disorder was believed to be confined to the Negro race; rare cases have been reported in Caucasians, and in 1937 Haden and Evans (Haden, Russell L., and Evans, Ferris D.: Sickle cell anemia in the white race. *Arch. Int. Med.* 60: 133-142, July 1937) recorded two cases in white persons with improvement following splenectomy. In 1943 Ogden (Ogden, M. A.: Sickle cell anemia in the white race. *Arch. Int. Med.* 71:164-182, Feb. 1943) also reported two cases of this disease in an active form in white families. It is possible, however, that sickle cell anemia in white persons is due to admixture of Negro blood in those of Mediterranean ancestry.

According to Ogden, the sickling trait is present in some 900,000, or 7 per cent of the total Negro population of the United States. His estimate of the number of persons who show an active sickle cell anemia is approximately 15 per cent of this number, or a proportion of one to seven. Such a high incidence removes sickle cell anemia from the truly rare diseases.

Serious complications are not uncommon. Vance and Fisher (Vance, B. M., and Fisher, R. C.: Sickle cell disease. *Arch. Path.* 32:378-386, Sept. 1941) reported a Negro woman of 49 who developed a fatal pulmonary fat embolism from lesions in the bone marrow. Hughes and his colleagues (Hughes, James

G., et al.: The involvement of the nervous system in sickle cell anemia. *J. Pediatrics* 17: 166-184, Aug. 1940) found that the central nervous system is frequently affected, the essential pathology in the brain and nervous system being primarily intravascular and due to thrombosis.

A recent clinical report on sickle cell anemia comes from Grover (Grover, Victor: The clinical manifestations of sickle cell anemia. *Ann. Int. Med.* June 1947, page 843) who tabulated clinical manifestations in 48 cases. Repeated occurrence of the following seven manifestations was emphasized: (1) cardiac enlargement, (2) the presence of diastolic as well as systolic murmurs of the heart, (3) prolongation of the P-R interval, (4) roentgenographic changes in the osseous system, (5) rapid and marked changes in the size of the liver and spleen, (6) neuropsychiatric signs and symptoms, especially mental deficiency, and (7) abdominal crises.

The treatment of sickle cell anemia is unsatisfactory. Little or no response has been obtained from its treatment by liver extracts. The only mode of attack which seems at all obvious today is along the line of genetics. In view of the widespread distribution of the sicklemic trait, however, an effort to prevent the disease by breeding out the trait seems wholly impractical. Barring the development of some unforeseen and effective new methods of treatment, sickle cell anemia would appear to be a disease with which physicians will be troubled for an indefinite period to come.

## PENICILLIN BY INHALATION

STUDIES made during the past year or two have improved knowledge concerning the administration of penicillin in aerosol form for the treatment of a number of diseases of the upper respiratory tract. Recently, Prigal et al. (Prigal, Samuel J. et al.: "Aerosol penicillin. J.A.M.A. 134:932-938, July 12, 1947) have published an article which places the technic of penicillin aerosolization on a still firmer basis.

Four technics were considered: open inhalation, airtight chamber, the tent method, and the breathing box. Open inhalation with the patient sitting about six inches from the aerosolizer is wasteful, but results nevertheless in an appreciable quantity of penicillin reaching the systemic circulation. In the airtight chamber method the patient breathes within a small chamber in which 180,000 units of penicillin in 20 cc. of propylene glycol is aerosolized. Prigal and his co-workers found that this method would produce a blood level of 1.0 unit of penicillin in the first half hour. With the tent method, an attempt is made to conserve the aerosol by confining it in a tent covering the head and upper part of the thorax. About two feet separate the patient and the aerosolizer. The patients were confined in the tent for three hours. This method results in high and prolonged levels of penicillin in the blood.

Finally, these investigators used a breathing box for those patients who found the tent uncomfortable. The box was airtight except for a small aperture through which aerosol was blown and an opening through which inhalation could be effected through a rubber tube and face mask. Breathing was continued through this for about a half an hour. Blood studies were made on patients who used this technic and the conclusion was reached that the breathing box constitutes a definite improvement over other methods. The breathing box lends itself to the use of mixed aerosols in such a manner that streptomycin, sulfona-

mides and possibly other antibiotics can be combined with penicillin.

Previous studies have shown that aerosol penicillin is a useful method of treating several types of upper respiratory disorders. The simplest method is open inhalation; this is apparently satisfactory for many patients. When more resistant conditions are encountered and when better scientific control is desirable, the breathing box method or one of the other closed technics seems to constitute a considerable improvement. The possibilities of mixing penicillin with propylene glycol or with other substances suggests that the future will hold a still wider range of therapeutic effectiveness for this treatment than the past.

## DIAGNOSIS AND TREATMENT OF MAXILLARY SINUSITIS

OBJECTIVE methods of diagnosing maxillary sinusitis include transillumination, anterior rhinoscopy, roentgenography with and without iodized poppyseed oil 40 per cent, and exploratory investigation. Burtoff has made a comparison of these accepted technics, and has brought to light some particularly interesting facts regarding the therapeutic efficacy of the solutions commonly used in irrigating the sinuses.

One hundred patients were divided at random into four groups of 25 each. Each group was treated initially with one of four irrigating solutions: isotonic solution of sodium chloride; 5 per cent sulfathiazole in iodized oil; 5 per cent sodium sulfathiazole in saline solution; penicillin in saline solution in strengths of 250, 500 and 1,000 units per cubic centimeter. If a patient did not respond to one solution, he was transferred to another group; if the second solution did not benefit the patient, he was placed in a third, and finally, a fourth group.

In 72 per cent of the patients, anterior rhinoscopy revealed that pus in the middle meatus, along the middle third or the posterior third of the inferior turbinate, was evidence that pus was present in the antrum. Transillumination was not found to give accurate diagnostic find-

ings. In 29 per cent of the cases transillumination was positive, while the antral return was negative. Conversely, in another 29 per cent transillumination suggested a negative finding, but the antral return was filled with purulent secretion. In the remaining 42 per cent the findings of the technic were confirmed by the antral return following irrigation.

In 86 per cent of the patients, the roentgenographic readings were confirmed.

When a patient was diagnosed as having maxillary sinusitis, exploratory irrigation with isotonic solution of sodium chloride followed. This treatment was continued in one group, but in the remaining three groups it merely preceded the use of one of the other solutions mentioned above. The efficacy of the various solutions was determined by bacteriologic studies of the antral return from the maxillary sinus. The most interesting finding was that the local use of an isotonic solution of sodium chloride, which is neither bacteriostatic nor

bactericidal, was just as effective in bringing about resolution of the sinusitis as was the local use of either the sulfathiazole or penicillin solutions.

When treated with any of the four solutions, patients with acute or subacute maxillary sinusitis improved after two to four applications. Chronic maxillary sinusitis secondary to allergy, did not improve with any solution; but chronic sinusitis of the non-allergic type showed earlier improvement with 5 per cent sodium sulfathiazole in saline solution than with 5 per cent sulfathiazole in iodized oil. However, neither these solutions nor the penicillin solutions were more effective than the isotonic saline solutions.

After the third or fourth irrigation, the penicillin no longer affected the susceptible organisms. None of the chemotherapeutic drugs proved to be of the value one might have anticipated on the basis of their systemic activity against the pyogenic organisms.

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# This Month in Medicine

## PLACENTA PREVIA

**T**WENTY-THREE years ago Watson and Miller demonstrated statistically that one of the best treatments of placenta previa was the ultraconservative, simple rupture of the membranes. Their views, however, did not take hold, with the result that the great majority of modern writers have insisted that a diagnosis of placenta previa is a signal for immediate, energetic, and heroic measures to be instituted.

In 1945 two investigators, Johnson in Texas and Macafee in Ireland, working independently, confirmed the suggestions of Watson and Miller and advocated a waiting policy in many cases of previa. They maintain that, in the absence of vaginal manipulation, hemorrhage is rarely if ever fatal. Particularly in cases that are not yet viable, they feel that temporizing will yield better fetal results.

To test further the virtue of this waiting policy, Eastman studied the records of 304 cases of placenta previa, and found that without vaginal manipulation fatal hemorrhage did not occur. He concludes, therefore, that nonviable or questionably viable babies can often be carried safely to viability, provided the mothers are in well equipped hospitals and under expert care.

Recently, Daichman and Pomerance have presented an analysis of 165 cases of placenta previa, in which they confirm in part the views of the aforementioned investigators. In this series the fetal mortality was 25.8 per cent and the maternal mortality was 0.6 per cent. These writers handled the greater number of their cases either by simple rupture of the membranes or by cesarean section. Blood transfusions were used frequently. They compared their results with those of an earlier series of 283 cases, treated at the same hospital. In this series of 283, pregnancy was terminated at the first episode of serious bleeding, and generous use was made of the hydrostatic bag—in other words, the conventional treatment. Fetal mortality was

46.3 per cent; maternal mortality was 5.3 per cent.

Daichman and Pomerance believe that eventually the bag will be discarded completely, and that temporizing in certain cases of placenta previa is worthy of trial, for it should lower fetal mortality.

### SUGGESTED READING

Watson, B. P., and Miller, D.: Treatment of placenta previa. *Edinburgh M. J.* 32:55 (April) 1925.

Johnson, H. W.: The conservative management of some varieties of placenta previa. *Am. J. Obst. & Gynec.* 50:248 (September) 1945.

Macafee, C. H. G.: Placenta previa—a study of 174 cases. *J. Obst. & Gynaec. Brit. Emp.* 52:4 (August) 1945.

Editorial: *Obst. & Gynec. Survey.* 1:53 (February) 1946.

Daichman, L., and Pomerance, W.: A statistical study of the cases of placenta previa occurring in the Jewish Hospital from 1935 to 1946. *Am. J. Obst. & Gynec.* 53:1024 (June) 1947.

## HYPERTENSION AND DIET

**T**wo years ago Kempner reported favorably on the use of a diet of rice, fruit, and fruit juices in the control of clinical hypertension. The reason for the reduction in blood pressure is not known, but the suggestion has been made that rigid sodium restriction could be responsible for the changes observed by Kempner.

Recently, Dick and Schwartz have studied the effect of the Kempner diet on 11 dogs in which hypertension had been induced and maintained for two to four years. The experimental diet consisted of 170 grams of rice, 340 cc. of fruit juice, and 60 grams of sugar. This basic diet was supplemented with adequate amounts of vitamins A, B, and D, and ferrous sulfate. The animals were kept on this diet for eight weeks.

Significant reductions in arterial pressure occurred in 10 of the 11 dogs. Before the induction of hypertension, the mean arterial pressure in mm. Hg. averaged 120.3 for the 11 dogs. After the induction of hypertension, the pressure rose to an average of 181.6. The average pressure was reduced to 138.0 after the animals had been on the experimental diet for eight weeks.

While these experimental results could never confirm Kempner's findings in human beings, they do suggest that his results might well be based on sound physiologic principles, and indicate the necessity of further studies in this field.

## SUGGESTED READING

Kempner, W.: Compensation of renal metabolic dysfunction; treatment of kidney disease and hypertensive vascular disease with rice diet. *North Carolina M. J.* 6:61 (February); 117 (March) 1945.

Grollman, A., and others: Sodium restriction in the diet for hypertension. *J. A. M. A.* 129:533 (October) 1945.

Dick, G. F., and Schwartz, W. B.: Response of experimental hypertension to a rice and fruit juice diet. *Proc. Soc. Exper. Biol. & Med.* 65:22 (May) 1947.

## ATOMIC BLEEDING

MANY of the survivors of the Hiroshima and Nagasaki bombings succumbed within a few weeks from internal hemorrhage. Apparently, near-fatal doses of atomic radiations caused excessive amounts of heparin to appear in the blood, with the result that fatal bleeding occurred.

Allen and Jacobson, of the University of Chicago, have found that a dye, toluidine blue, may be found useful in preventing hemorrhage, in the event of any future bombings. A dog with radiation sickness similar to that observed in the Japanese at Hiroshima and Nagasaki was found to have a clotting time of over forty-eight hours. Within twenty minutes after toluidine blue was injected into its veins, the dog's clotting time had returned to normal. The administration of vitamin K, as well as blood transfusions, failed to prevent or control the hemorrhage. The dye was successful.

## SUGGESTED READING

Editorial: Protection against A-bomb effects. *Chemistry* 20:36 (June) 1947.

## ECLAMPSIA

NUMEROUS writers have emphasized the necessity of prophylaxis, education and adequate prenatal care for the prevention and control of eclampsia. A recent statistical study by Bernstein and Prince has substantiated this view.

Of 62 cases of eclampsia, 48 had only inadequate prenatal care, while 14 had no prenatal care whatever. In the group that had inadequate prenatal

care, the maternal mortality was 12.7 per cent. In the group that had no prenatal care, the mortality was 28.5 per cent; one mother in every 3.5 of this group died.

## SUGGESTED READING

Bernstein, J. B., and Prince, L. N.: An analytical survey of eclampsia. *Am. J. Obst. & Gynec.* 53:972 (June) 1947.

## COLCHICINE AND CANCER

FOR several years colchicine has been known to influence nuclear division, arresting the dividing nuclei in the metaphase stage, and causing an accumulation of cells in that phase. Likewise, roentgenologists have pointed out that dividing nuclei are more vulnerable to the action of x-rays than are resting tissues. Obviously, therefore, the combined use of colchicine and x-rays in the treatment of cancer was suggested, the idea being that the drug would get the cancer cells into stages of development most susceptible to x-ray treatment.

Some investigators have proceeded along these lines. However, essential critical cytologic studies have been scarce, studies which would indicate exactly when, after colchicine administration, the tissues to be treated are most vulnerable to x-ray. Levine and Silver recently have made such an investigation, in which they have attempted to answer the question as to when x-ray therapy should begin.

These investigators found that a single intramuscular injection of 2 mg. of colchicine causes an arrest of nuclear division in the metaphase stage of human cancer. The number of cells in this stage slowly increases until it reaches a maximum between the sixteenth and twenty-fourth hours after the drug was administered. After that, the number of metaphase cells gradually declines. This response was uniform among all 7 patients in their series. However, the exact number of cells that went into metaphase varied with the patient and with the type of cancer presented. During the period of maximum response, the number of metaphase plates per H.P.F. varied from 1.7 to 14.3.

## SUGGESTED READING

Levine, M., and Silver, G. B.: Mitotic response to colchicine in human cancer. *Proc. Soc. Exper. Biol. & Med.* 65:54 (May) 1947.

R. W. C.

# Consultation Service

This special consultation information service is offered as a regular monthly feature of *Postgraduate Medicine*. Readers are invited to call on this Service for answers to difficult medical problems from members of our Editorial Board best qualified to help. Each question will be answered by mail and those of general interest will be published each month. Address all communications to Consultation Service, *Postgraduate Medicine*, 512 Essex Building, Minneapolis 2, Minnesota.

## SURGERY FOR CIRRHOSIS OF LIVER

*QUESTION: What surgical procedure is used in cirrhosis of the liver when ascites is present? What are the results of such surgery?*

M.D.—Minnesota

**ANSWER:** A variety of ingenious surgical procedures for the treatment of cirrhosis of the liver with ascites have been developed in the past, in addition to the time honored palliative paracentesis. These procedures have consisted for the most part of establishing collateral circulation to the portal system, or of obliteration of part of the portal bed so that venous blood is diminished to an amount which might pass through the cirrhotic liver. Other operations have been designed to drain the ascitic fluid into the systemic circulation and even into the urinary tract. Attempts to obliterate the tributaries feeding into the veins of the cardia and esophageal varices shut off two of the chief collaterals between portal and systemic circuits and only increase the portal hypertension.

With the present day methods of preventing and combating shock, improved medical measures of preventing further parenchymal liver damage with high protein-carbohydrate diets and high vitamin therapy, and measures to correct hypoproteinemia, the mortality from surgical procedures in the presence of cirrhotic livers is greatly diminished. Of the many surgical procedures that have been tried for this condition the portacaval shunt (Eck fistulae) or some modification of it probably offers the most promise.

The rational of establishing portacaval shunts for relief in portal hypertension has been known since the turn of the century. However, due to technical difficulties, little hope was held for its clinical application until Whipple<sup>1</sup> and Blakemore

and Lord<sup>2</sup> demonstrated the value of the nonsuture technic of anastomosing blood vessels to this problem. In a recent article Blakemore<sup>3</sup> reports an experience in which 23 portacaval and splenorenal shunts were completed for portal hypertension with but four postoperative deaths. Deaths from liver failure in two of the cirrhosis patients he attributes to errors in judgment in the selection of cases. These must be chosen with great care. Relief from wasting ascites and gastrointestinal tract hemorrhage was obtained in nearly all the survivors in the series for one or more years and many of these patients were able to resume work in their former occupations.

## REFERENCES

1. Whipple, A. O.: The problem of portal hypertension in relation to the hepatosplenopathies. *Ann. of Surg.* 122: 449-476. October 1945.
2. Blakemore, A. H., and Lord, J. W., Jr.: The technic of using Vitallium tubes in establishing portacaval shunts for portal hypertension. *Ann. of Surg.* 122:476. October 1945.
3. Blakemore, A. H.: Indications for portacaval anastomosis—an analysis of cases. *Surg., Gynec. & Obst.* 84: 645-653. April 15, 1947.

## PENICILLIN CONCENTRATION

*QUESTION: What is the highest concentration in which penicillin may be used intramuscularly and intrathecally? What is the evidence other than pathologic that penicillin does not penetrate the brain substance and what is the explanation of the so-called blood-brain barrier?*

M.D.—Ohio

**ANSWER:** It is undesirable to use more than 20,000 units of penicillin intrathecally per diem by the lumbar root. The application of 50,000 or more units to the cerebrum both in animals and man has produced convulsions. It has also been shown that large intrathecal injections of penicillin in five

monkeys have produced patchy demyelination in the nerve roots of three.

There is no specific explanation of the so-called blood-brain barrier. It is known, however, that doses of penicillin given parenterally (1,000,000 units or more) will produce adequate concentrations of the antibiotic in the cerebral spinal fluid. As much as 2,000,000 to 4,000,000 units of penicillin have been given in a single intramuscular injection in aqueous solution at four-hour intervals.

#### DEAF-MUTISM

*QUESTION: Is deaf-mutism hereditary? What would be the hazard, if any, if a young lady married a man who had three brothers who are deaf mutes? Would it be a safe assumption that any of her descendants might not be similarly affected?*

M.D.—Wisconsin

ANSWER: Deaf-mutism is either congenital or acquired. Acquired deaf-mutism is not hereditary. This type properly includes that resulting from induction of labor with quinine and that due to rubella in the early months of pregnancy. The consensus of those who have investigated the incidence of deaf-mutism is that there is some risk of deaf-mutism in the children of parents who hear normally, in the family of either one of whom there may be a history of congenital deaf-mutism. The incidence of deaf-mutism is, however, very low. One deaf-mute is born in fifty-eight marriages between persons in whose families there is a history of deaf-mutism.

#### FURUNCULOSIS

*QUESTION: A child, 1-1/2 years old, has been subject to repeated furunculosis, particularly in the diaper area. Sulfathiazole or penicillin ointment have been without effect. The child is healthy, doesn't have diabetes and takes regular vitamin C and D supplements. Cod liver oil ointment has been tried without avail. The diapers are changed frequently and powder used. What is the treatment?*

M.D.—Iowa

ANSWER: I would recommend that the physician in charge of the case avoid the local use of oily ointments, since they are apparently ineffective, applying some simple powder such as sulfathiazole powder to the open furunculosis. I would recommend that the parents avoid using diapers for a time while keeping the baby's buttocks exposed to dry heat provided by light bulbs and a tent over the crib. Whether the baby has fever or not, it may be useful to give him an intensive course of penicillin parenterally if the furunculosis persists. Of course, it is assumed that the general health of the patient is being looked after in such a manner that the presence of diabetes mellitus has been excluded. If this should exist, of course treatment for diabetes should be instituted.

After the lesions have healed and diapers are again used, the mother should make a practice of boiling the diapers before each use. Obviously she should be warned to change the baby as often as necessary to keep the baby dry and prevent maceration of the skin.

#### CIRRHOSIS OF LIVER

*QUESTION: A patient with cirrhosis of the liver has done very well on a high carbohydrate, high protein diet, intravenous liver, choline and vitamin B therapy. What criteria should be used to determine the point at which it is possible to discontinue this intensive therapy and rely on oral medication?*

M.D.—Wisconsin

ANSWER: If one can interpret "done very well" to mean that the patient has no evidence of edema, that he has gained weight and strength and is now able to carry on his usual occupation, then the criteria which would allow the patient to discontinue the intravenous administration of liver extract and the taking of choline and vitamin B have been fulfilled. However, the patient should be impressed with the importance of continuance of a high carbohydrate, high protein, and moderate fat diet.



# MEN OF MEDICINE

## THE CHALLENGE OF THE GORDIAN KNOT

NOT many of the admiring clinical staff or foreign medical visitors who have watched the easy deftness with which Chevalier Jackson extracts a safety pin or a rosary from an infant's bronchial tubes would guess that the same light touch can turn out a towering soufflé or a quivery galantine. But the man's talents are indeed that varied. Perhaps a French grandfather had something to do with the delectable savor of the rôti and the *je ne sais quoi* of the potage, but long experience has developed the grandson's skill and broadened his scope.

Jackson served his chef's apprenticeship many years ago while he was a student at Jefferson Medical College. Frugal living was a necessity. Carrying scuttles of coal from the basement to the rooms of more affluent students served to pay his rent, and cooking his own meals on a flat-topped laundry stove in his attic room was never a chore but a culinary opportunity.

As his ingenuity increased he added to his repertory such specialties as Philadelphia pepper pot soup and fried scrapple with browned apple slices. Such tidily economical dishes were more successful than the pot-roasted reedbirds contributed by a fellow student who had been hunting along the marshy Delaware shore. One of the fine bones, lodged in young Jackson's tonsil, created great excitement at the College Hospital, not so much because of the clinical features of the case as because of the mystery of how a shabby medical student could have come by such a gastronomic delicacy as a reedbird!

It was completely in character that later in life Dr. Jackson gave up first game, and then most animal food. Love of wild song birds and of animals generally made the decision natural. Hunting, like other sports that he considers brutal, was ab-

horrent to him; and even today, in his home at Old Sunrise Mill near Philadelphia, he has a special feeding platform for the birds and squirrels whose friendly presence he values.

But at one period when young Jackson was having a hard time earning the money to finance his last year of medical school, cooking became not a mere avocation but his profession. Doubtless for years the captain and crew of a certain fishing schooner off the Grand Banks of Newfoundland remembered wistfully the delectable fish chowder and incomparable plum duff magically evoked from the limited ship's stores by the thin, delicate-looking "green hand" who couldn't fish worth a cent but who made the voyage memorable for its food.

Dr. Jackson does not regard his skill with herbs and earthenware casseroles as extraordinary. "Cooking," he remarks, "is like drawing; it can be done well by anyone who wants to, but he must want to obsessively."

Dr. Jackson himself, whether he realizes it or not, started with a lot of innate talent underneath his desire to draw. That skill first found its outlet in sketching flowers, trees and landscapes and its practical application in decorating glass lamp shades to help pay his college expenses, and later in reproducing in meticulous detail and pulsating color the intricacies of the larynx, the bronchus, and esophagus. He is an etcher of note, a painter of distinction; his chalk talks setting forth the involvement and reaction of delicate tissues penetrated by foreign bodies are cherished in the memories of generations of students.

Wood-turning and complicated inlay work have been a pleasure so long, and the skill that produces them so much a part of him that the good doctor stoutly denies possessing any hobbies what-

ever. The same loving craftsmanship that went into the making of a gavel and inlaid wooden gavel box for the Pan - American Medical Association—a remarkable production utilizing twenty-two pieces of wood, one from each of the nations of the Western Hemisphere — has also been used in making and in manipulating the delicate instruments required by the field of bronchoscopic diagnosis and surgery. It has been said of Chevalier Jackson that his genius lies in his fingers, those knotty yet perceptive fingers ordinarily protected by neat gray silk gloves. His extraordinarily varied accomplishments demonstrate the truth behind the truism.

Working with delicately balanced and adjusted instruments inside a tube scarcely bigger round than a soda straw, he can reach and recover an open safety pin from the vitals of a ten-weeks-old infant with the easy grace of a magician and a magician's apparent nonchalance. But beneath the practiced dexterity that averted the fatal consequences of an avoidable accident, Dr. Jackson, a practical man and a true humanitarian, harbors a profound and angry contempt for the careless people who leave open safety pins ("Hopelessly misnamed," he fumes) and similar tantalizing trivia within the reach of groping baby fists. He



CHEVALIER JACKSON, M.D.

admits that educating parents is a thankless task, but he's not one to shirk an obvious duty.

Allowing toddlers to play with coins or suck potentially deadly peanut candy is one type of hazard, but years ago Dr. Jackson battled and conquered a worse danger to children—unlabelled powdered lye generally used as a household cleanser and practically indistinguishable in appearance from sugar. Swallowing lye so burns the esophagus that the constricting scar tissue frequently makes

swallowing impossible. Sensitive Dr. Jackson saw enough of such suffering children among his poor patients to influence him to use every means to attack the danger. Though not a crusader by temperament, he set himself doggedly to the fight for laws requiring the labelling of such caustics as lye: POISON.

Heartily disliking all the red tape and underhandedness of legislative lobbying; suspicious and contemptuous of politicians in the aggregate, he nonetheless sacrificed a tremendous amount of time, of his own never-abundant money, of precious vital energy in the long struggle that culminated in the passage of the Federal Caustic Act providing for a poison and an antidote label on every can of lye or other caustic that goes into a house. The bill became law with the affixing of the signature of President Coolidge in March 1927.

Looking back on that long struggle that was, paradoxically, both deeply rewarding and superficially irritating and uncongenial, the doctor comments: "The work of physicians in prevention equals their work in curing disease."

The quiet comment is characteristic of Chevalier Jackson, but one should not be led into assuming that his dander is never up beneath the placid surface. One of the easiest ways to rouse him is the flat and simple statement that something or other is impossible. Being a practical man with justified faith in his brain, eyes and fingers, he's convinced that for most physical problems, there's a solution. And he has very little respect for the unthinking impulsiveness of young Alexander who, confronted with the convolutions of the Gordian knot, merely whipped out his sword and severed it. Never would Chev Jackson be either so foolhardy or so unresourceful. The more difficult the problem the greater the challenge. Neither skepticism nor established authority has ever deterred him from seeking a solution.

LIFE has only strengthened traits that showed themselves early. An incident that illustrates his characteristic tenacious perseverance is related in his autobiography, published in 1938:

"Our home was twenty-five miles from oil-producing territory. When I was about twelve years old a 'wildcatter,' as prospective drillers were called, agreed

to put down a test well free of cost to Father, on the basis of an agreement that Father would get one-eighth interest in the oil if any were found.

"After some weeks of drilling operations the driller sent word the tools were lost down the well. When Father and I arrived at the derrick Father asked if the tools could not be recovered.

"'Tain't possible, Mr. Jackson—'tain't possible, I tell ye. She's down more'n fifteen hunnerd feet; 'n' the bottom fi' hunnerd feet is plugged full o' rope; ol' rotten, wet, sand-soaked rope rammed down like er wad in a gun. Nippin' tools ain't no good. 'Tain't no use wastin' time tryin' to git that out. Better start a new hole some'ers near; not too near, though, er the two holes ull pull theirsels together. Leastways that cussed ol' hole ull pull the new hole over inter it afore ye git down fi' hunnerd feet. Ther ain't nothin' meaner'n a cantankerous ol' drillin' wor's gone wrong. She's allus bewitched. Hell-bent on spoilin' any nigh drillin'.' And the old oil driller gave vent to his feelings about mean wells by ejecting a mouthful of tobacco juice across the shed into the matted hair of his sleeping dog. Good for fleas, he said parenthetically.

"Two things intrigued me as I listened to the report Father got about the calamity that had befallen the prospective oil well on which hope of getting out of debt depended. The verdict 'impossible' started me thinking hard. With the powerful pull of the rope that I had watched hundreds of times drawing up the half-ton of drilling tools, power seemed plentiful; it was only a question of attaching a new rope to the plug of rope. But this plug of old rope was nearly a thousand feet from the surface down in a six-inch hole drilled in the rock and lined part way with iron casing. The drilling tools in common use consisted of a drill bit somewhat like a gigantic cold chisel. This was incessantly hammered into the rock, and rotation of the bit gave an approach to roundness to the hole. The hammering mechanism was quite simple. It consisted of a loose-link jar resulting from the coupling together of two long bars of steel by long eyes forged in the joining ends. To the lower end of the lower bar the chisel-like bit was attached with a taper screw threading.

"In drilling the rock strata the tools alternately were raised and dropped a few feet by the rope attached to the walking beam. The heavy bit and steel rod dropped with heavy impact; then the upper rod dropped the length of the loose-link joint and struck a heavy blow on the lower rod and its integral bit. This loose-link jar hammer appealed to my budding mechanical genius as a means of driving a harpoon into that plug of old rope; but my mechanical instinct reasoned that a single pair of barbs like a harpoon would pull out, so I sketched a long harpoon bit of triangular cross-section with barbs staggered around the distal three-fourths of its twelve-foot length. This was to be

screwed into the lower rod of the jar mechanism in place of the drill bit. "Tain't a bad idee," said the old driller as he anointed the dog with a dose of flea exterminator.

"I was sent with my sketch to the huge forge in Pittsburgh where oil drilling tools were then made. 'Idea's all right,' said the toolmaker, 'but ye can't make no sech tool.' This impulsive preliminary opinion was revised when a nicely carved wooden model was presented. The harpoon was made, attached to the jar tools, lowered into the hole on a good new rope, hammered down with the jar until all the barbs had been buried in the plug of old rope. Then a barrel of oil was put down the hole. At the first upward pull the stretch was taken out of the new rope; and then the plug began to move upward. The enthusiasm engendered by the appearance above ground of the harpoon firmly embedded in the proximal end of the old rope resulted in extermination of probably all the fleas.

"The monetary results were nil. The well was a 'duster.' The multibarbed harpoon became a standard fishing tool; but no patents were applied for, and no recompense accrued to the inventor. This first foreign body case was thus typical of hundreds of subsequent, technically very successful bronchoscopic cases."

Chev Jackson never hankered to become a pill-or medicine-giving doctor. He followed his path to an unguessed goal, usually solving varied mechanical problems by employing his own skill. So there is considerable satisfaction in reflecting on the fact that the number of fatalities in bronchoscopy has been reduced to near the vanishing point. The doctor himself once estimated that new methods and delicately articulated special instruments, for both of which he is chiefly responsible, have made bronchoscopy not only safe but 98 per cent successful in foreign-body cases. This record presents a gratifying contrast to earlier conditions.

Extreme simplicity, frequently austerity, have long characterized Chevalier Jackson's personal life, sometimes, particularly during his early years, because of hard necessity, more recently from choice. Abstemious to an unusual degree, he not only avoids alcohol and tobacco but he is that extraordinary phenomenon, a gifted and imaginative cook who has no taste for the delights of the table. Lightly, he waves aside such gustatory pleasures, confining himself to a critical sampling of sauces and gravies that occasionally vary his simple regimen of fruits and vegetables.

Having no taste for self-indulgence, Chevalier Jackson sets small store by material possessions. True he has a large fireproof vault for valuables built into his study at his home in Arden, but what he stores and prizes are the irreplaceable case histories and records accumulated during long years of varied and active practice. It was also, especially at the beginning, a remarkably poor practice. The doctor cheerfully admits his own lack of any proper financial sense, but he also had to contend with the customs of the time.

IN THE early days increasing success as a practitioner, particularly in the developing specialties of bronchoscopy, esophagoscopy, and gastroscopy, brought many poor but hopeful patients who were unable to pay; it brought prestige and recognition even to the extent of being elected, when he was only thirty-five, to the chair of Laryngology in the Western Pennsylvania Medical College, later absorbed by the University of Pittsburgh. Unfortunately "the great honor carried with it additional expenses but no salary. The attached hospital position not only paid no salary but involved considerable expense for equipment and instruments; and, worst of all, was the impoverishing steady drain of the salary of an operating-room nurse. Not one cent toward any of these necessary expenses came from any hospital or collegiate source. Everything had to be financed out of a practice that was 95 per cent charity. . . . Those were lean years."

And as he became better known, the laryngologists of Pittsburgh referred to him all their patients requiring bronchoscopy, esophagoscopy, gastroscopy, and endolaryngeal surgery. Thus was created the ever-broadening opportunity that gave the earnest, hard-working young specialist an unusually extensive experience in the newer procedures and in the diagnosis and treatment of the diseases to which these procedures were applicable. Many of the instruments he needed, or in some cases the models for them, he made himself in a little workshop in the cellar. But money was still pitifully scarce, so much so that one day one of his colleagues was stirred to an exasperated question: "Say, Chev, don't you *ever* have a paying patient?"

Many years later Professor Keen, conscious of the same background of boundless opportunity and grueling hours of work, said in more serious vein: "Chevalier Jackson's skill was acquired by a lifetime of work with the poor." Ruefully, Dr. Jackson suggests that there might well be appended to that remark, a second: "He was poor himself and a poor business man besides."

Chevalier Jackson never had any money to speak of; his time was given generously to his patients, to his teaching, to painstaking research and experiment, with none left over for hobbies or social life; his health, never robust, was in the course of an active career, three times undermined by recurring attacks of tuberculosis. The strict regimen required to combat that disease automatically cut down his practice—and his income—as well as the amount of available time for accomplishment. Undaunted, however, he emerged from the second anti-tuberculous regimen with the manuscript of *Peroral Endoscopy and Laryngeal Surgery* ready for the publisher.

That massive production has now long been regarded as marking, indeed as helping to create, an era in medicine: that of direct inspection in the diagnosis of disease. It was based primarily, as are all of Dr. Jackson's writings, on exhaustive material collected while doing clinical work. This type of work embodies a tenet of faith for the



Sketches by S. J. Woolf, Courtesy of "The Rotarian"

doctor, whose ideals of medical writing are therein illustrated.

"My inferences may be wrong, but I hope some little importance may attach to the cases reported. Clinical facts always remain clinical facts, primary inferences are more often wrong than right. For example, when I was a fisherman out of Gloucester all British ships were called 'lime-juicers.' It had been discovered that lime juice would prevent scurvy, and the marine laws required that every ship, in order to get clearance papers for long voyages, must have on board so much lime juice per day, per man. Medical writers have given many different causes for scurvy and reasons for the efficiency of lime juice in its prophylaxis and

treatment. The various opinions in turn have been rejected, but the clinical fact of efficiency remains today as stubborn a thing as it was a century ago."

Concerning who originally amassed the material, and who benefited in prestige from using it thereafter, Dr. Jackson has always been extremely generous—exasperatingly so at times from the point of view of his colleagues. One of them once wrote him in a burst of eloquent indignation as follows:

"Most things you have written served as quarries from which builders of articles obtained materials for new structures. I could recognize the stones you have carved, but others have attributed the handiwork to the quarrymen."

**T**HE gist of Chevalier Jackson's reply is extraordinary if not unique in the medical profession.

"Plagiarism of idea or phraseology is a form of imitation that is indeed the most sincere flattery. Nothing gives me greater pleasure because it means either the writer considers my work so good he deems it worthy of himself, or my teaching has made such a profound impression on him that he really thinks he did it himself. In either case I have evidently done a good piece of work."

Akin to his ideal of unselfish personal contribution to the body of medical knowledge is Dr. Jackson's refusal to patent any of his tools and instruments whether they were adapted for fairly general use or cunningly fashioned for a single highly complex case. Related, too, is his scorn of those who do patent such devices in order to profit from their manufacture and sale. His own addition to the esophagoscope of a light carrier involved using such a light "then recently patented by a soulless mechanic" (originally for use on a cystoscope).

Even more far-reaching and fundamental in Dr. Jackson's view of widespread service to humanity is the proper treatment and training of assistants. He regarded such young men in his laboratories and clinics not as potential rivals ready to appropriate his knowledge and ideas but as disciples who must be trained and encouraged to become themselves apostles of service.

He once wrote to an editor of a surgical maga-

zine a letter of advice, based on long years of experience in the bronchoscopic clinic in Philadelphia, entitled "How to Train an Assistant." He concludes thus: "At the end of a few years, if you have done your job well, you have created a great surgeon, and he is young enough to do creative work, many years of it. He will have sufficient ego to think he has done it all himself. And that is just what he needs to go forth with confidence and carry on tradition, a power for good in this world. You have launched a great ship that will sail away an independent unit on the great sea of life."

Most noteworthy among his specific suggestions was his admonition to build up the beginner's ego: "Give him an easy case in which he can do full justice to the patient; encourage him to report the case before staff or medical meetings and praise his presentation; give him credit in your own writings—don't be afraid to make it more than he deserves; to convince him his services are valuable, pay him not only a good salary, but add such perquisites as expenses to medical meetings, nurse's service, operating room equipment, instruments, photographs, copies of histories and charts; build up a following for him, both professional and lay; if possible secure for him a teaching position where he will carry on the tradition. And if, after years of such preferential treatment, he rewards his benefactor with the peculiarly volatile gratitude that leads him to advance his benefactor's discoveries as his own, be prepared to take that, too, in your stride!"

When informed by a colleague that one of his erstwhile assistants was dazzling an audience with ideas that Jackson had promulgated before the youngster started to study medicine, Dr. Jackson could reply with grave sincerity that he took great pleasure in the news, for the assistant in question "was the slowest man I ever had in the development of ego; it seemed he would never learn to stand on his own feet. Evidently he is now ready to spread widely the gospel of safe bronchoscopy."

It has long been Dr. Jackson's dream to spread that gospel ever more widely not only by producing confident, well-trained men in the field but by establishing efficient bronchoscopic clinics in all big cities, thus broadening the possibilities of service



to humanity. That is his own view of his life-long obligation and of his life work.

"I deem it my duty to create as many as possible of the centers for the teaching as well as for the clinical application of the life-saving methods to the development of which I have devoted my life. . . . I am inspired by the responsibility to teach everything I know to everyone who will listen and learn."

At his home near Philadelphia, the city of Brotherly Love that welcomed him so warmly to the Professorship of Laryngology at Jefferson Medical College when he was fifty-three years old, and the city to which he contributed so much of health and of life itself, there at Arden he still works, writes, sketches, paints, meditates. It is appropriate that he should find comfort in the writing chair of special design with broad arms and properly proportioned back; that he should find diversion and solace in the quiet, specially equipped electric boat in which he goes adventuring upon the millstream; and that on the terrace of the concrete fireproof study built to protect irreplaceable case-records he should feed and watch the song birds and bright-eyed squirrels.

And this pleasant life is just and fitting because the frail thoughtful man who lives it made the chair in his own workshop (politely referred to by the family as the "experimental laboratory"). He conceived in his inventive, ingenious mind the idea for a boat quiet enough to disturb neither birds nor thought, yet commodious enough to allow him to write medical papers out of doors; he rejoices that the defenseless wild creatures are safe in his grounds just as during the long years of practice so many frightened helpless children were, by his knowledge and sure, gentle touch, brought back to safety and to life itself.

AND in those congenial surroundings, Chevalier Jackson has been able to devote himself to completion of a tremendously significant life's work. To him it was given to be a prophet with honor in his own country as well as the recipient of honors justly and generously bestowed abroad. That recognition he values, as he values the respect and esteem of his colleagues, the affectionate regard of generations of students, but there is one underlying satisfaction that is deeper and closer to his heart than any other. A good many years ago he wrote in a letter:

"It has always seemed to me a solemn obligation resting on all of us to pass on to the next generation everything we can to fit the coming men for carrying on our work when we shall have laid down the tools. It would be a crime to allow them to start where we started, to learn as we have learned by making over again the mistakes we have made. What difference will it make to the next generation whether it was Jackson, Johnson, Smith, or Jones who discovered bronchially lodged peanuts as potentially fatal to children? The important thing is for the disciples to expound the gospel of education of mothers as to the dangers of peanuts and nut candies to the baby without molars.

"If I can so saturate the young man with an idea that he comes really to believe he originated the idea himself, I feel I have done a good job."

# Book of the Month— A Report

## GYNECOLOGY INCLUDING FEMALE UROLOGY\*

THE brilliance of Dr. Lawrence R. Wharton, long attested to by those who received their training under him, is clearly evident in this revision of his excellent textbook. This second edition is destined to receive the same wide acclaim that was accorded the book upon its first appearance in 1943.

During his many years on the teaching staff of Johns Hopkins Medical School and Hospital, Dr. Wharton has contributed greatly to a better understanding of the relationship of the autonomic nervous system to the female genitourinary organs. His operation for the artificial construction of the vagina is widely recognized as the treatment of choice for agenesis of the vagina.

In keeping with the author's wide experience as a teacher, practitioner and investigator, the store of information in this single volume has been well chosen and is nicely integrated into a clear, logical sequence. The book has been considerably revised and much new material added.

In the preface the author states that he has attempted to present both sides of controversial questions, particularly in regard to such active problems as functional uterine bleeding and malignancy. Bringing material up-to-date has required rewriting entire sections and making changes and additions in others. Developments in operative technics are presented together with new illustrations. A new chapter on water cystoscopy, written by Dr. Charles B. Prince has been added to the part of the book devoted to Female Urology.

The first two sections of the text present in a well organized and lucid manner the anatomy, em-

bryology, and congenital malformations of the female genitalia. The chapter on embryology, which has been largely rewritten, is divided into three stages in the prenatal life history of the genitourinary organs. This division gives the reader a clear outline of facts necessary to understand the following chapter on congenital malformations which deals with imperfect differentiation of sex, sex reversal, agenesis, inhibitions in development and resulting anatomic and functional defects.

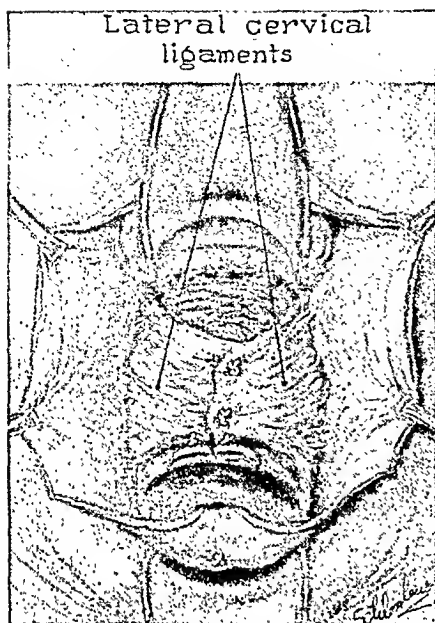
Dr. Wharton introduces a section on physiology and functional disturbances with a brief chapter on the life history of the reproductive organs and the endocrine glands. He believes that when the isolation and purification of the gonadotropic hormones is accomplished more will be known about many disturbances in the gynecologic-endocrine relationship.

Several chapters are respectively devoted to discussion of the gonadotropic hormones, ovarian changes during the reproductive cycle, the estrogenic hormones, and the clinical features and disorders of ovulation. Twelve methods of studying ovulation and ovarian function are presented, including observation of cervical mucus, endometrial biopsy, and changes in the basal temperature curve. Painful ovulation is discussed in some detail with emphasis on the clinical features, associated symptoms and findings, diagnosis, and treatment.

The subject of functional uterine bleeding is introduced by chapters on menstruation and types of menstrual disorders. Although recent studies are cited to show that abnormal uterine bleeding may occur from any type of endometrium, the author states that most instances of extreme uterine bleeding have occurred from estrogenic endometria. The only fatalities that have been recorded were observed in patients with atrophic endometria. The

\*Gynecology with a section on Female Urology. By Lawrence R. Wharton, M.D. 1027 pages, 479 illustrations. W. B. Saunders Company, Philadelphia and London. 1947. Price \$10.00.





Parametrial fixation. Step 4: Reefing the lateral cervical ligaments.

diagnosis of functional bleeding in adult women is never made without careful medical and gynecologic examination to rule out organic causes. Distinction is made between mild and persistent bleeding in the type of treatment to be recommended. The indications for hygienic therapy, curettage, hysterectomy, irradiation therapy, and the use of endocrine preparations are clearly stated by the author.

A chapter is devoted to hyperplasia of the endometrium which is described as the only pathologic entity exhibited by the endometrium in patients with functional bleeding. Mention is omitted of the role of irregular shedding, another possible entity which is gaining increasing recognition as a factor in the etiology of functional bleeding.

Chapters on dysmenorrhea, the menopause, and the sympathetic nervous system in gynecology and female urology complete the section on physiology and functional disturbances. Dr. Wharton believes that the vasomotor phenomena in the menopause and also during normal menstruation will be better understood by improved knowledge of the relationship between the sympathetic nervous system and the endocrines, reproduction, and menstruation. The autonomic nerve supply of the pelvic organs is demonstrated by illustrations of dissections per-

formed by the author, and the indications and technic for performing presacral neurectomy are presented.

A chapter on the art of gynecologic diagnosis appropriately precedes the section of the text devoted to childbirth injuries and diseases of the genital organs. The operative treatment of childbirth injuries is presented with consideration of limitations, precautions, and contraindications for each separate procedure. The technic of each operation is described in steps and illustrated with well selected drawings. The author stresses the adequate fixation of the vagina in vaginal hysterectomy to prevent subsequent prolapse. He also recommends leaving a mushroom catheter in the bladder for at least three days after vaginal plastic surgery to put the operative area at rest.

The subject of fistulas is preceded by an interesting discussion of the historical background of operative therapy. Principles emphasized in the treatment of vesicovaginal fistulas include good exposure, free mobilization of the tissue layers, closure of the fistula in layers in different directions, use of metallic sutures, and use of the indwelling urethral catheter.

In the section devoted to pelvic infections, the subject of gonorrhea in women is discussed in its various phases and during pregnancy. The author believes that the length of conservative treatment for chronic salpingitis is often guided by social, domestic, and economic features. Separate chapters are devoted to genital tuberculosis, puerperal infections, and syphilis.

Pruritis, cyclic changes in the vaginal epithelium, leukorrhea, and vaginal infections are discussed under the general heading, "Diseases of the Vulva and Vagina." The causes of leukorrhea are classified as physiologic, constitutional, and pathologic. The diagnosis and treatment of the bacterial, protozoal, and fungus forms of vaginitis are presented.

In the chapter on diseases of the cervix, the author stresses the importance of removing those lesions in which carcinoma frequently finds soil for growth. Radical cauterization of the cervix preceding supracervical hysterectomy is suggested to obviate the need for total hysterectomy. Carcinoma of the cervix is given detailed attention with

stress laid on prevention and the detection of early lesions. The statistical results reported by different clinics show that there is still no uniform agreement as to the choice of surgery or radiation, alone or combined, in the treatment of this disease.

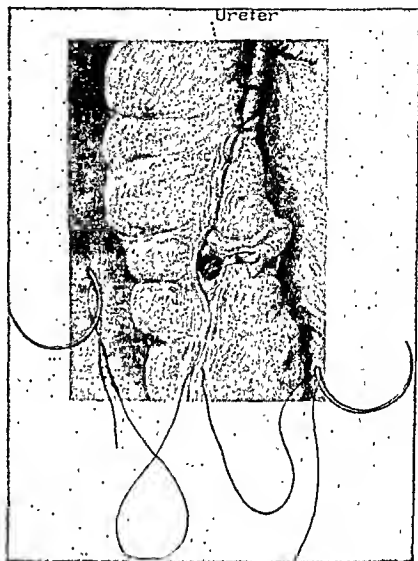
In the chapter on myomas of the uterus, Dr. Wharton presents strong evidence for the surgical approach to this problem as against irradiation. In 500 consecutive operations for myomas, he found 12 instances of unsuspected malignancy and 17 neoplasms of potential malignancy. The operative mortality for the removal of large or symptomatic myomas is less than the mortality that would result if the associated conditions were left unaltered, according to this study.

Recent studies are quoted to show that radiation therapy alone is not reliable for the treatment of carcinoma of the endometrium. The most reliable therapy is total hysterectomy with removal of both tubes and ovaries. In performing this operation several precautions are listed for the prevention of implantation of malignant tissue on the peritoneum. The author cites recent studies to show that the combined use of preoperative radiation and total hysterectomy increases the survival rate of patients with this disease.

The choice between total and subtotal hysterectomy for benign diseases of the uterus is discussed in a chapter devoted to hysterectomy. The technics of these two procedures are described according to the method of Richardson and illustrated with drawings by Max Brödel. Total hysterectomy is stated to be a more serious and difficult operation in respect to operative accidents, complications, and mortality. Thus it should be used only when the subtotal hysterectomy with pre-operative cauterization of the cervix would be unsatisfactory or incomplete.

Chapters on diseases of the fallopian tubes and ovaries follow. A classification of ovarian tumors based on cytologic characteristics is presented. Endometriosis, sterility, extrauterine pregnancy, and abortion comprise the subjects discussed in the following section. The text on gynecology is concluded with a section on postoperative care and normal hygiene.

Because of the close relationship between diseases of the female genitalia and urinary organs, the

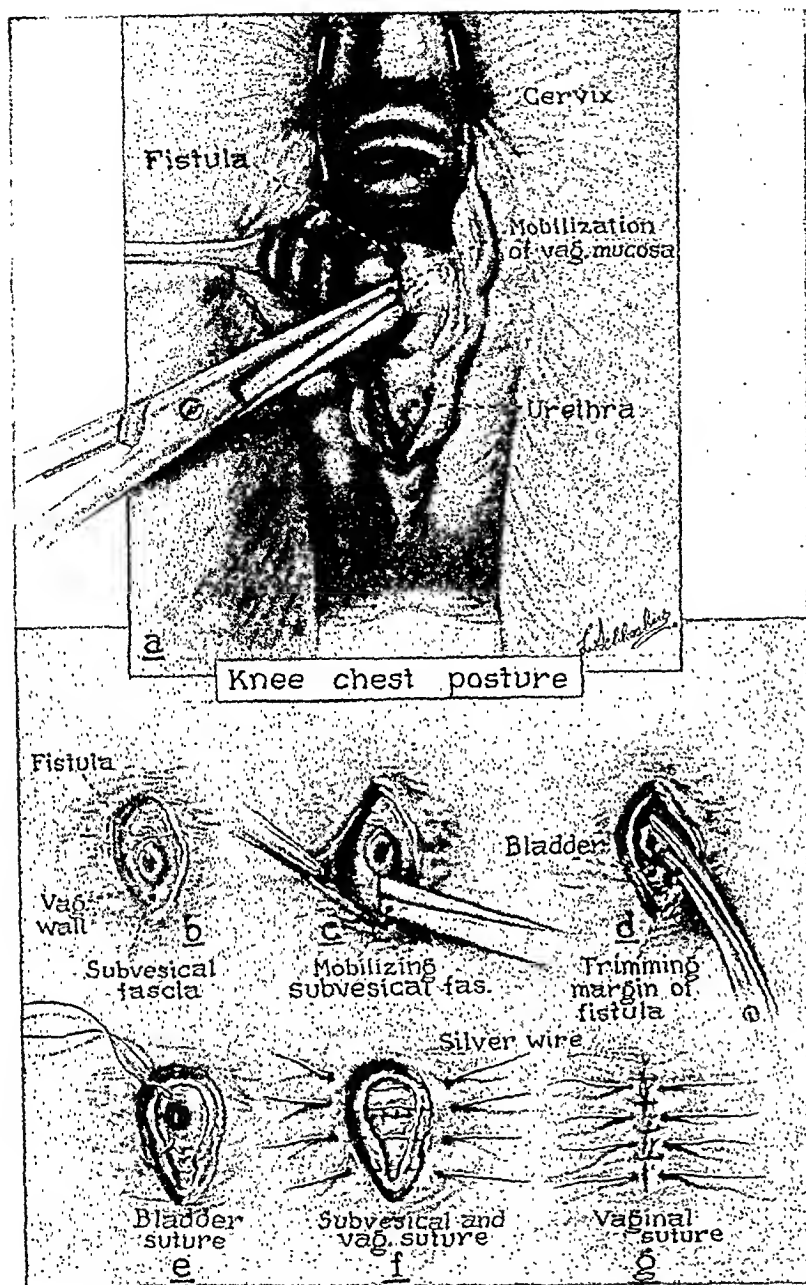


Ureteral implantation into the bowel.

author devotes a considerable part of the book to female urology. One may question the value of this section to the practicing gynecologist but the fact remains, as stated by the author in the preface, that the urinary organs are the sites of the most serious complications in obstetric and gynecologic practice.

The material on urology is introduced by a section on anatomy, embryology, congenital malformations, and methods of urologic diagnosis. The Kelly air method of cystoscopy is described as being a simple, quick, and easy method with which every gynecologist should be acquainted. The technic for this time-honored method is presented followed by a chapter describing the more modern methods of water cystoscopy.

The author then proceeds with a full discussion of obstructions, infections, stones, and neoplasms with emphasis on those conditions related to obstetrics and gynecologic practice, such as the chapters on pyelitis of pregnancy, injuries of the urinary tract, and ureteral implantation. The book is con-



Illustrations from: *Gynecology including Female Urology* by Wharton

Closure of a vesico-vaginal fistula. The layers of the vesico-vaginal septum are dissected out and closed separately, whenever possible. *a*: Mobilization of the vaginal wall around the fistula; *b*: vaginal wall mobilized and retracted from the fistula, exposing the next layer, the subvesical fascia; *d*: the fascia mobilized and bladder wall exposed. The scarred edges of the fistula are trimmed off, giving fresh surfaces to heal. In *c*, the opening is being closed, using a continuous suture of fine (00) chromic catgut. The suture is laid at right angles to the other suture lines; *f*: sutures of fine silver wire, through both fascia and vaginal wall. Before these are tied, one may approximate the fascia with interrupted sutures of chromic catgut, 00. This step is not illustrated. After the silver wire sutures are tied, the closure of the vaginal wall may be reinforced by a few interrupted sutures of fine catgut, as shown.

concluded with chapters on chemotherapy and on irradiation in gynecology and female urology.

The book should continue to be of value to medical students, general practitioners, and gynecologists. Much of the material in the text represents the teachings of such prominent predecessors of the author as Howard A. Kelly and Thomas S. Cullen. However Dr. Wharton has drawn on the reports of many gynecologists, urologists, and physicians from all sections of the country, as well as from his own experiences and those of his contemporaries at Johns Hopkins Hospital.

All references are listed in bibliographies at the end of the chapters. The index to the text fills 27 pages of fine print. Many of the illustrations are excellent drawings by the late Max Brödel and by his daughter Elizabeth, originally made for Drs. Kelly and Cullen, respectively. The drawings by Schlossberg, prepared for the author, are limited in number but are of excellent quality. In general the text represents a cross-section of sound gynecologic and urologic thought, well documented, logically constructed, and presented in a clear, readable manner.

M. S.

# What Other Editors Think

## Editorial Evaluations of Current Contributions To Medical Progress

### THE GENERAL PRACTITIONER HAS HIS INNINGS

THE progress made within the past few years toward providing a more secure status for the general practitioner is really remarkable. When it became evident that the emphasis on specialization was endangering the supply of general practitioners, the leaders of organized medicine began to take steps to halt and, if possible, reverse the trend.

The Section on General Practice, which had held trial sessions since 1943, was made a permanent member of the A.M.A. family in 1946. In Chicago last December the House of Delegates passed two resolutions for the general practitioner's benefit. One was intended to encourage the inclusion of general practitioners on the staffs of hospitals, and to discourage the requirement of certification as a requisite for membership on a hospital staff. The second resolution gave the green light to a certification board for general practice, to be set up under the auspices of the Section on General Practice.

In the Atlantic City session this year, the Council on Medical Education and Hospitals issued a supplementary report disclaiming any intent to close the staffs of hospitals to general practitioners, and urging that general practice sections be organized in hospital staffs. In his address to the House, President Harrison Shoulders stated that the most urgent need in medicine is increasing the number and availability of general practitioners, and recommended a special committee to study the distribution of medical care, especially in terms of the general practitioner.

President-Elect Bortz recommended an additional session for the general practitioner in connection with the midwinter session of the House of Delegates. He also suggested that this midwinter session be rotated from one area of the

United States to another, instead of being held in Chicago every year. The recommendations of both the retiring and the incoming presidents were unanimously adopted.

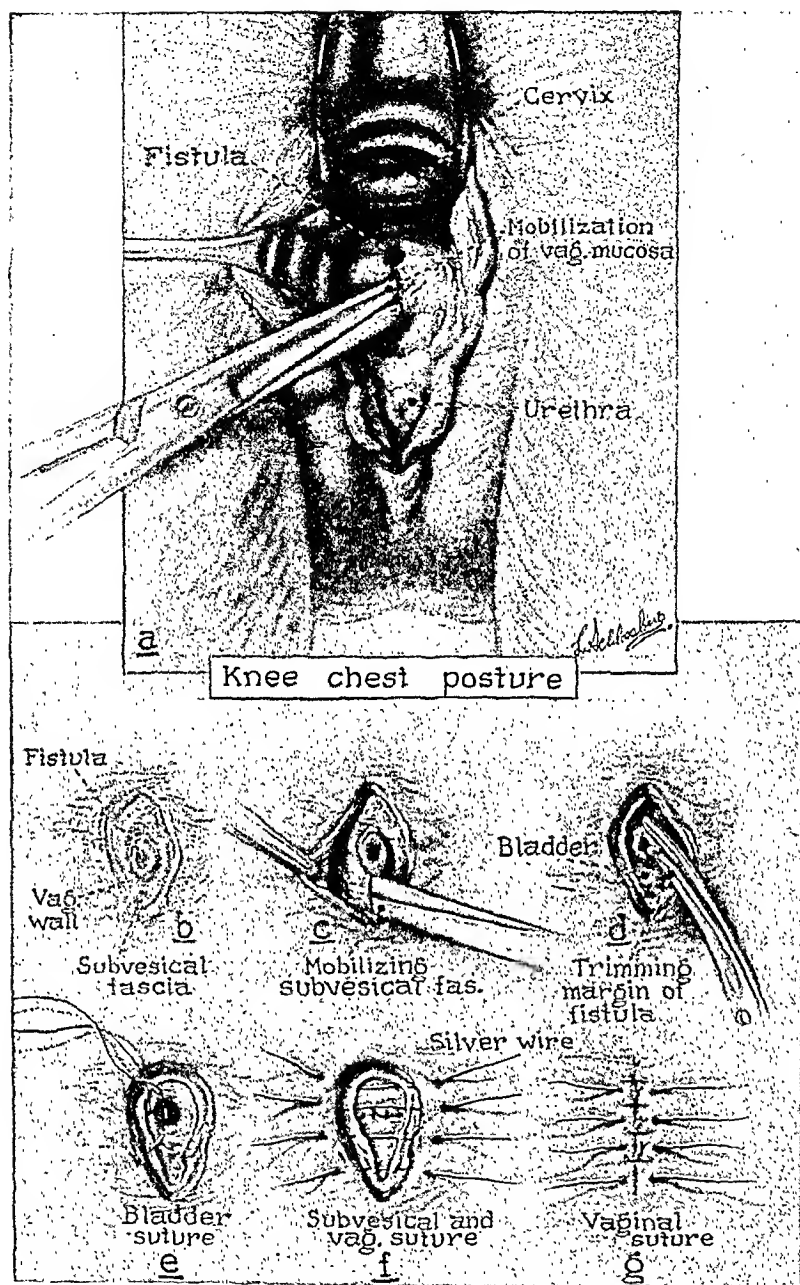
The committee appointed from the Section on General Practice to consider the advisability of setting up a specialty board for general practice decided that the establishment of such a board should be postponed for the present, at least. Instead, an organization to be known as the "American Academy of General Practice" was formed, with Dr. Paul Davis of Akron, Ohio, as its president. Dr. Davis was chairman of the Section on General Practice this year.

The Academy of General Practice is to be a national organization, presumably analogous to the College of Physicians or the College of Surgeons. One commendable feature which is embodied in its by-laws provides that membership "shall terminate at the end of three years, and to be eligible for reelection . . . a member must have maintained his high moral and professional character, and must have spent a minimum of one month during his three-year period in postgraduate training of a nature acceptable to the membership committee."

The objects and purposes of the organization are given as follows:

1. To promote and maintain high standards of the general practice of Medicine and Surgery;
2. To encourage and assist in providing postgraduate study for general Practitioners in Medicine and Surgery, and to encourage and assist practicing physicians and surgeons to participate in such training;
3. To encourage and assist young men and women to prepare, qualify and establish themselves in general practice;
4. To protect the right of the General Practitioner to engage in Medical and Surgical procedures for which he is qualified by training and experience;
5. To advance medical science and private and public health.

Qualifications for membership are set forth in the by-laws:



Illustrations from: *Gynecology including Female Urology* by Wharton

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M. S.

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three minutes; a "course" is one daily dose for three or four days. There are various toxic effects. An early symptom is nausea and vomiting coming on within a few hours, and some patients get this after every dose.

The first blood change is lymphopenia, and then the granulocytes are diminished; with this dosage the anemia produced should be only slight; the platelet-count is often lowered. These effects are temporary and after about five weeks hemopoiesis is back to normal. So far as the research has proceeded—the longest follow-up is two years—it seems that doses of this nitrogen mustard can be repeated without the danger of inducing an irreversible aplasia of the blood-forming tissues. Overdosage, or giving the drug in too concentrated a form, is liable to cause serious destruction of hemopoietic and lymphatic tissues, and fatal aplastic anemia may be the result.

Nitrogen mustard treatment has now been given to patients with several neoplastic diseases, but significant success has been obtained only in diseases involving the blood-forming or lymphatic tissues. Trials with metastatic mammary and cervical carcinoma and with melanosarcoma have not been encouraging, though Rhoads reports a temporary remission with "anaplastic carcinoma" of the lung. The best results have been obtained in Hodgkin's disease.

With lymphosarcoma, 4 out of 6 patients had clinical remissions lasting three to eighteen months—a result comparable with that gained by x-ray treatment. Acute leukemia is as unresponsive to nitrogen mustard as to other therapy. With chronic lymphatic leukemia the results have not so far been as satisfactory as with x-rays; in chronic myeloid leukemia the results have been variable, in some cases a remission lasting several months being obtained, while in others there was only transient symptomatic improvement although the leucocyte count was reduced. In polycythemia vera nitrogen mustard treatment induced a lowering of the red-cell count and symptomatic improvement lasting a few months. The treatment had no effect in multiple myeloma.

*The Lancet*, Vol. 252, p. 914.

## GLUTAMIC ACID

GLUTAMIC ACID is an important constituent of brain tissue. It is the only amino-acid known to be metabolized by the brain, in which it increases oxygen consumption. Wheat gluten contains glutamic acid in abundance. The connection between our daily bread and the functioning of the brain has recently been brought into the foreground of speculation by Mellanby's experiments with dogs. Feeding dogs of the same litter at one time on untreated flour, and at another time on flour commercially bleached and "improved" by nitrogen trichloride, he found that dogs fed on the improved flour developed canine hysteria, from which they remained free while on a diet of untreated flour.

In the United States, interest in these questions was first focused on the feeding of glutamic acid to rats, from which it was found that their powers of maze learning were improved. Zimmerman, Burgemeister, and Putnam have reported an experiment in which glutamic acid was fed to 9 children of whom 7 were epileptic and two mentally retarded. Their ages ranged from 16 months to 17 years. Sufficient glutamic acid was given to produce a noticeable increase in motor activity, the dose varying from 6 to 24 gm. a day by mouth; this dosage was maintained for six months.

In every one of the epileptic children there was clinical improvement, 5 of the 7 ceasing to have fits; but treatment by phenobarbitone and other drugs had been continued, and the improvement cannot be attributed with any certainty to the glutamic acid. Apart from the 2 youngest children, aged 16 months and 2 years, both of whom were seriously retarded, all the remaining children showed a greater improvement in intelligence than could be expected from lapse of time alone. There were improvements in the intelligence quotient of from 5 to 13 points, with an average of 9.

It is perhaps permissible to speculate whether these improvements in intelligence were due not to a direct action of the extra glutamic acid but to its protective action against the subclinical ill-effects of the children's normal diet of bread made from treated flour.

*British Medical Journal*, July 12, 1947, p. 62.

# New Drugs

Information published in this department has been supplied by the manufacturers of the products described.

## RUTIN TABLETS

**PURPOSE:** A purified product prepared by extraction from buckwheat for use in restoring increased capillary fragility to normal.

**COMPOSITION:** Each tablet contains 20 mg. of Rutin, a crystalline glucoside of quercetin derived from buckwheat and purified by recrystallization, which makes assay and accurate dosage possible.

**DESCRIPTION:** Greenish-yellow tablets.

**INDICATIONS FOR USE:** To restore increased capillary fragility to normal, preventing vascular accidents in patients with hypertension, and in various hemorrhagic conditions in which capillary fragility or permeability is involved. It arrests the progress of diabetic retinitis and has been shown to be effective against persistent bleeding of gums and nose caused by capillary fragility.

**DOSAGE AND ADMINISTRATION:** Orally, one tablet (20 mg.) three times a day; occasionally in refractory cases 40 mg. three times a day, or even more, may be given. Rutin therapy should be continued even after capillary fragility has returned to normal. Adequate intake of Vitamin C is indicated simultaneously.

**HOW SUPPLIED:** 20 mg. tablets supplied in bottles of 100.

**LIST PRICE:** Bottle of 100 tables (20 mg.)—\$5.00.

**PRODUCER:** E. R. Squibb & Sons, New York, N. Y.

## 'LYO-B-C' PRINCIPAL B-COMPLEX FACTORS WITH ASCORBIC ACID

**PURPOSE:** For the parenteral treatment of vitamin B-complex and ascorbic acid deficiency states: interference with absorption and ingestion, increased metabolism, psychiatric use, debilitated states, addition to infusions, wound healing.

**COMPOSITION:** Each 'Vacule' vial of 'Lyo-B-C' contains thiamine hydrochloride (vitamin B<sub>1</sub>), 100 mg.; riboflavin (vitamin B<sub>2</sub>), 10 mg.; pyridoxine hydrochloride (vitamin B<sub>6</sub>), 10 mg.; calcium pantothenate, 50 mg.; niacinamide, 25 mg.; ascorbic acid (vitamin C), 200 mg.

**DOSAGE:** Daily dosage, intravenously, is the contents of one 'Vacule' vial restored to 5 cc. or it may be added to intravenous infusion. Daily dosage, intramuscularly, is the contents of one 'Vacule' vial restored to 2 cc.

**HOW SUPPLIED:** In a 'Vacule' vial with a 5 cc. vial of distilled water, sterile, or in 25-5 cc. vials of dried material with 5-25 cc. vials of distilled water, sterile.

**PRODUCER:** Sharpe & Dolme, Philadelphia, Pa.

## SYRUP CHOLINE DIHYDROGEN CITRATE (FLINT)

**PURPOSE:** In the prevention and treatment of fatty infiltration of the liver.

**DESCRIPTION:** Palatable form of choline. The dihydrogen citrate salt is less hygroscopic and more stable than the chloride.

**INDICATIONS FOR USE:** Fatty infiltrations of the liver; early cirrhosis; related hepatic syndromes.

**DOSAGE:** 2 to 3 teaspoonfuls (2 to 3 gm. choline dihydrogen citrate) per day in divided doses.

**HOW SUPPLIED:** Pint and gallon bottles.

**PRODUCER:** Flint, Eaton & Company, Decatur, Ill.

## MUCOTIN

**PURPOSE:** Treatment of peptic ulcer and gastric hyperacidity.

**COMPOSITION:** Each Mucotin tablet contains: gastric mucin, 2½ gr. (0.16 gm.); dried aluminum hydroxide, 4 gr. (0.26 gm.); magnesium trisilicate, 7 gr. (0.45 gm.).

**DESCRIPTION:** Within physiologic dosage, Mucotin is non-toxic and has a minimal effect on gastrointestinal functions. Its highly purified mucin is virtually histamine-free and will not produce acid rebound.

**DOSAGE:** The usual dose is 2 tablets every 2 hours, or as directed by physician. To obtain optimal results, tablets must be chewed thoroughly.

**HOW SUPPLIED:** Dose-dispenser packages of 50 tablets.

**PRODUCER:** Harrower Laboratory, Inc., Glendale, Cal.

## FERROUS GLUCONATE STABILIZED (BREON)

**PURPOSE:** For the treatment of hypochromic anemia.

**COMPOSITION:** Hematinic, 12 per cent iron by weight and 98 per cent in the ferrous state.

**INDICATIONS FOR USE:** In the anemias of infants, growing children, pregnancy, and of middle-aged women.

**DOSAGE:** Tablets: Adults 3 to 6 per day.

Children 1 to 2 per day.

Elixir: Adults 4 to 8 teaspoonfuls daily.

Children 1 to 4 teaspoonfuls daily.

**CAUTIONS:** Prolonged concurrent administration of iron and phosphorus preparations may result in rickets.

**HOW SUPPLIED:** Tablets, 5 grain, in bottles of 100, 500, 1,000. Elixir, 5% (7% alcohol) in bottles of 6 fl. oz., pints, gallons.

**PRODUCER:** George A. Breon & Co., Kansas City, Mo.

## QUIN-DIEM

**PURPOSE:** Nutritional essential for therapeutic purposes.

**COMPOSITION:** Each capsule Quin-Diem contains:

Vitamin A	25,000 U.S.P. Units
Thiamine hydrochloride	5 mg.
Riboflavin	10 mg.
Niacinamide	50 mg.
Ascorbic acid	150 mg.
Vitamin D (Irradiated Ergosterol)	1000 U.S.P. Units

**INDICATIONS FOR USE:** Nutritional therapy in multiple vitamin deficiency states.

**DOSAGE:** One to three capsules daily depending upon the requirements of the individual case as determined by the physician.

**HOW SUPPLIED:** Quin-Diem is promoted solely to the medical profession for prescription when a vitamin deficiency state has been diagnosed. Quin-Diem is supplied in bottles of 50, 100 and 250 soft elastic, yellow capsules.

**PRODUCER:** McNeil Laboratories, Inc., Philadelphia, Pa.

## MESANTOIN

**PURPOSE:** For epilepsy.

**COMPOSITION:** 3-methyl-5,5-phenyl-ethyl-hydantoin.

**INDICATIONS FOR USE:** Grand mal and psychomotor equivalents of epilepsy.

**DOSAGE:** Average dosage of Mesantoin for adults is from 2 to 6 tablets (0.2 to 0.6 gm.) daily. This dosage may be raised up to 8 tablets (0.8 gm.) daily and more if necessary to control seizures. Children require from 1 to 4 tablets (0.1 to 0.4 gm.). In general, dosage should be adjusted to the needs of the individual patient by establishing smallest effective dose required to suppress, or reduce to a minimum, the frequency of seizures.

**CAUTIONS:** Some patients taking full therapeutic doses may develop a morbilliform, itching skin rash sometimes associated with elevation of body temperature. Dosage should be reduced drastically (approximately 50 per cent) and replacement of the anticonvulsant effect by a barbiturate. If rash persists or increases, medication with Mesantoin should be discontinued.

**HOW SUPPLIED:** Tablets (0.1 gm.)

PRICE:	Bottles of	Druggists
	50	\$1.00
	250	3.90
	1000	13.20

**PRODUCER:** Sandoz Chemical Works, Inc., New York, N. Y.

## SODIUM NICOTINATE, 140 MG., STERILE SOLUTION

**PURPOSE:** Vasodilator.

**COMPOSITION:** Each 10 cc. contains:

Sodium nicotinate	140 mg. (equivalent to 100 mg. nicotinic acid).
Double distilled water	q.s.

**DESCRIPTION:** Induces dilation of the cranial and peripheral vessels without affecting blood pressure. For use in alleviating the vasoconstrictor types of headache such as migraine, headaches associated with high blood pressure and nervous tension, and headaches following spinal puncture.

**ADMINISTRATION:** Intravenous injection of 10 cc.

**HOW SUPPLIED:** Six 10 cc. ampuls \$2.45. Twenty-five 10 cc. ampuls \$7.00.

**PRODUCER:** The Upjohn Company, Kalamazoo, Mich.

## PROGESTERONE IN OIL

**PURPOSE:** A pure crystalline preparation of Progesterone for use in preventing certain accidents of pregnancy and in treating certain menstrual disorders resulting from a deficiency of the corpus luteum hormone.

**COMPOSITION:** A sterile preparation of pure crystalline Progesterone (delta<sup>4</sup> 3, 20 diketone pregnene) in corn or sesame oil. Standardized in terms of International units, one I. U. being the progestational activity of 1 mg. of the crystalline standard.

**DESCRIPTION:** A clear, yellow oily liquid.

**INDICATIONS FOR USE:** Certain cases of habitual or threatened abortion; pregnant diabetic women with low pregnandiol and high chorionic gonadotrophin levels; dysmenorrhea; functional bleeding, amenorrhea; premenstrual tension; pain due to uterine contractions following parturition.

**DOSAGE AND ADMINISTRATION:** Intramuscularly. Average dose is 5 or 10 mg. but dosage varies from 2 to 50 mg. according to condition being treated. Given with estrogen in pregnant diabetic women and in amenorrhea; possibly with estrogen in functional bleeding and in premenstrual tension.

**CAUTIONS:** None.

**HOW SUPPLIED:** A sterile solution of Progesterone in Oil supplied in four strengths: 2 mg. per cc. and 5 mg. per cc. in 1 cc. ampuls (in corn oil) and 10 mg. per cc. and 25 mg. per cc. in 5 cc. rubber-stoppered vials (in sesame oil).

**LIST PRICE:**

2.0 mg. per cc. 1 cc. ampul, box of 5 ampuls	\$ 2.58
5.0 mg. per cc. 1 cc. ampul, box of 5 ampuls	4.33
10.0 mg. per cc. 5 cc. rubber-stoppered vial	5.67
25.0 mg. per cc. 5 cc. rubber-stoppered vial	13.50

**PRODUCER:** E. R. Squibb & Sons, New York, N. Y.



## Association Notes



JAMES E. PAULLIN, M.D.

Presiding at the 1947 Assembly of the Interstate Postgraduate Medical Association at St. Louis, October 14 to 17, will be Dr. James E. Paullin, President of the Association. Dr. Paullin, who is Professor of Clinical Medicine at Emory University School of Medicine, is also Chief of Medicine of Emory University Division of Grady Hospital. During World War I, he served as a Major in the Medical Corps, U. S. Army and was Honorary Consultant to the Surgeon General, U. S. Navy, in World War II. Dr. Paullin was president of the American Medical Association in 1943-1944 and has held the office of president of the American Clinical and Climatological Society, American College of Surgeons and the Southern Medical Association.



HERMAN L. KRETSCHMER, M.D.

The president-elect of the Interstate Postgraduate Medical Association, Dr. Herman L. Kretschmer, will assume office at the 1947 Assembly of the Association at St. Louis, October 14 to 17. Dr. Kretschmer is Clinical Professor of Surgery (Genito-Urinary), Rush Medical College, University of Illinois, formerly University of Chicago. He is ex-president of the American Medical Association (1944-1945), American Board of Urology, Chicago Medical Society, Chicago Urological Society, American Urological Association, American Association of Genito-Urinary Surgeons, and is a member of the Board of Trustees of the Institute of Medicine. Dr. Kretschmer is also a member of the International Urological Association and the American College of Surgeons.

# PROGRAM

## International Medical Assembly

### Interstate Postgraduate Medical Association of North America

October 14, 15, 16, 17, 1947

St. Louis, Missouri

Tuesday, October 14

8:00 A. M.

8:00 Diagnostic Clinic: "The Medical Management of Hyperthyroidism."

Dr. Daniel L. Sexton, Assistant Professor of Clinical Medicine, St. Louis University School of Medicine, St. Louis, Missouri.

8:30 Diagnostic Clinic: "The Acute Abdomen; Roentgenographic Aids in Diagnosis."

Dr. LeRoy Sante, Professor of Radiology and Director of the Department, St. Louis University School of Medicine, St. Louis, Missouri.

9:00 Diagnostic Clinic: "The Farmer's Back."

Dr. Robert D. Schrock, Professor of Orthopedic Surgery, University of Nebraska, Omaha, Nebraska.

9:30 Diagnostic Clinic: "Carcinoma of The Esophagus."

Dr. Michael E. DeBakey, Assistant Professor of Surgery, The Tulane University of Louisiana School of Medicine, New Orleans, Louisiana.

10:00-11:00 *Intermission for Review of Exhibits*

11:00 Diagnostic Clinic: "Regional Enteritis,—Diagnosis and Management."

Dr. Charles B. Puectow, Associate Professor of Surgery, University of Illinois College of Medicine, Chicago, Illinois.

11:30 Diagnostic Clinic: "Diabetes."

Dr. Elliott P. Joslin, Clinical Professor of Medicine, Emeritus, Harvard Medical School, Boston, Massachusetts.

*Noon Intermission*

1:30 P. M.

1:30 Diagnostic Clinic: "Psychosomatic Medicine and Methods of Diagnosis."

Dr. Edwin F. Gildea, Professor of Psychiatry and Head of the Department of Neuropsychiatry, Washington University School of Medicine, St. Louis, Missouri.

2:00 Diagnostic Clinic: "Use of Parenteral Feeding in the Surgical Treatment of Intestinal Fistula."

Dr. Robert Elman, Associate Professor of Clinical Surgery, Washington University School of Medicine, St. Louis, Missouri.

2:30 Address: "The Surgical Treatment of Coarctation of The Aorta."

Dr. Oscar T. Clagett, Surgical Section, Mayo Clinic; Assistant Professor of Surgery, Mayo Foundation, University of Minnesota Graduate School of Medicine, Rochester, Minnesota.

3:00-4:00 *Intermission for Review of Exhibits*

4:00 Address: "Laboratory Methods and Their Interpretation."

Dr. R. B. H. Gradwohl, Director, Gradwohl School of Laboratory and X-ray Technique, St. Louis, Missouri.

4:30 Address: "Present Methods in The Treatment of Anterior Poliomyelitis."

Dr. Wallace H. Cole, St. Paul, Minnesota, Professor of Orthopedic Surgery and Surgery, University of Minnesota School of Medicine, Minneapolis, Minnesota.

5:00 Address: "Scrotal Enlargements."

Dr. R. Theodore Bergman, Associate Professor of Urology, School of Medicine, College of Medical Evangelists, Los Angeles, California.

*Dinner Intermission*

7:30 P. M.

7:30 Address: "Anorexia Nervosa."

Dr. John M. Berkman, Mayo Clinic; Assistant Professor of Medicine, University of Minnesota Graduate School of Medicine, Rochester, Minnesota.

8:00 Address: "Advances in The Treatment of Glaucoma." (The Schneider Foundation Eye Presentation.)

Dr. Edward J. Curran, Professor of Ophthalmology, University of Kansas School of Medicine, Kansas City, Missouri.

8:30 Address: "The Present Status of Antibiotic Therapy."

Dr. John A. Kolmer, Professor of Medicine, in

Charge of Bacteriology and Immunology, Temple University School of Medicine; Director, Research Institute of Cutaneous Medicine, Philadelphia, Pennsylvania.

9:00 Address: "Endocrine Therapy in The Treatment of Prostatic Cancer."

**Dr. Reed M. Nesbit**, Professor of Surgery—Urology, University of Michigan Medical School, Ann Arbor, Michigan.

**Wednesday, October 15**

**8:00 A. M.**

8:00 Diagnostic Clinic: "Ligation of Persistent Ductus Arteriosus."

**Dr. James L. Mudd**, Assistant Professor of Surgery, St. Louis University School of Medicine, St. Louis, Missouri.

8:30 Diagnostic Clinic: "The Xiphosternal Crunch; Its Recognition and Its Unfortunate Role in Life Insurance and Employment Rejections."

**Dr. Myer Solis-Cohen**, Assistant Professor of Medicine, University of Pennsylvania Graduate School of Medicine, Philadelphia, Pennsylvania.

9:00 Diagnostic Clinic: "The Results of Electric Shock Therapy."

**Dr. Leland B. Alford**, Associate Professor of Neurology and Psychiatry, St. Louis University School of Medicine, St. Louis, Missouri.

9:30 Diagnostic Clinic: "Differential Diagnosis of Bronchial Asthma, and Management."

**Dr. Leon Unger**, Associate Professor of Medicine, Northwestern University Medical School; Attending Physician at Cook County Hospital and at Wesley Memorial Hospital, Chicago, Illinois.

10:00-11:00 *Intermission for Review of Exhibits*

11:00 Diagnostic Clinic: "Buerger's Disease, Its Diagnosis and Management."

**Dr. Geza de Takats**, Associate Professor of Surgery, University of Illinois College of Medicine, Chicago, Illinois.

11:30 Diagnostic Clinic: "Lung Failure."

**Dr. James D. Adamson**, Professor of Medicine and Director of the Department of Internal Medicine, University of Manitoba School of Medicine, Winnipeg, Manitoba, Canada.

*Noon Intermission*

**1:30 P. M.**

1:30 Diagnostic Clinic: "Drug Allergy."

**Dr. Harry L. Alexander**, Professor of Clinical Medicine, Washington University School of Medicine, St. Louis, Missouri.

2:00 Diagnostic Clinic "The Anemias."

**Dr. Cyrus C. Sturgis**, Professor of Internal Medicine, Director of Simpson Memorial Institute and Chairman of the Department of Internal Medicine, University of Michigan Medical School, Ann Arbor, Michigan.

2:30 Diagnostic Clinic: "Peptic Ulcer."

**Dr. Frank H. Lahey**, Director, Lahey Clinic; Surgeon, New England Deaconess and New England Baptist Hospitals, Boston, Massachusetts.

3:00-4:00 *Intermission for Review of Exhibits*

4:00 Address: "Diagnosis and Treatment of Infectious Hepatitis."

**Dr. Richard B. Capps**, Assistant Professor of Medicine, Northwestern University Medical School, Chicago, Illinois.

4:30 Address: "The Application of Radioactive Iodine to The Study and Treatment of Thyroid Diseases."

**Dr. Francis R. Keating, Jr.**, Assistant Professor of Medicine, Mayo Foundation, University of Minnesota Graduate School of Medicine, Rochester, Minnesota.

5:00 Address: "Dissecting Aneurysms of The Aorta."

**Dr. James E. Paullin**, Professor of Clinical Medicine, Emory University School of Medicine, Atlanta, Georgia; President, Interstate Postgraduate Medical Association of North America; Honorary Consultant in Internal Medicine to the Surgeon General, U. S. Navy.

*Dinner Intermission*

**7:30 P. M.**

7:30 Address: "Tumors of The Brain; Advances in Diagnosis and Treatment."

**Dr. Winchell McK. Craig**, Section on Neurological Surgery, Mayo Clinic; Professor of Neurosurgery, University of Minnesota Graduate School of Medicine, Rochester, Minnesota.

8:00 Address: "The Cancer Problem."

**Dr. Edward L. Bortz**, President, American Medical Association; Associate Professor of Medicine, University of Pennsylvania Graduate School of Medicine, Philadelphia, Pennsylvania.

8:30 Address: "The Curious Syndromes Produced by Little Unrecognized Cerebral Thromboses."

**Dr. Walter C. Alvarez**, Mayo Clinic; Professor of Medicine, University of Minnesota Graduate School of Medicine, Rochester, Minnesota.

9:00 Address: "Respiratory Emergencies."

**Dr. John A. Toomey**, Professor of Clinical Pediatrics and Contagious Diseases, Western Reserve University School of Medicine, Cleveland, Ohio.

**Thursday, October 16**

**8:00 A. M.**

8:00 Diagnostic Clinic: "Repairs of Major Defect of the Face."

**Dr. James Barrett Brown**, Associate Professor of Clinical Surgery, Washington University School of Medicine, St. Louis, Missouri.

8:30 Diagnostic Clinic: "Diagnosis and Treatment of Psoriasis."

**Dr. Clinton W. Lane**, Assistant Professor of Clinical Dermatology, Washington University School

of Medicine, St. Louis, Missouri.

9:00 Diagnostic Clinic: "Diagnosis and Treatment of Myasthenia Gravis."

**Dr. Henry R. Viets**, Lecturer on Neurology, Harvard University Medical School, Boston, Massachusetts.

9:30 Diagnostic Clinic: "The Middle Lobe Syndrome."

**Dr. Evarts A. Graham**, Bixby Professor of Surgery and Head of the Department, Washington University School of Medicine, St. Louis, Missouri.

10:00-11:00 *Intermission for Review of Exhibits*

11:00 Diagnostic Clinic: "Subarachnoid Hemorrhage and Intracranial Aneurysm."

**Dr. Henry G. Schwartz**, Professor of Neurological Surgery, Washington University School of Medicine, St. Louis, Missouri.

11:30 Diagnostic Clinic: "The Diagnosis and Treatment of Hydronephrosis."

**Dr. Herman L. Kretschmer**, professor of Urology (Surgery), University of Illinois College of Medicine, Chicago, Illinois; President-Elect Interstate Postgraduate Medical Association of North America.

*Noon Intermission*

1:30 P. M.

1:30 Diagnostic Clinic: "Surgery of The Pancreas."

**Dr. Richard B. Cattell**, Lahey Clinic, Boston, Massachusetts.

2:00 Diagnostic Clinic: "Diseases of The Thyroid."

**Dr. George Crile, Jr.**, Cleveland Clinic, Cleveland, Ohio.

2:30 Address: "Aseptic Necrosis of Bone; Its Management and Prognosis."

**Dr. Dallas B. Phemister**, Thomas D. Jones, Professor Emeritus, Department of Surgery, University of Chicago School of Medicine, Chicago, Illinois.

3:00-4:00 *Intermission for Review of Exhibits*

4:00 Address: "Resection and Primary Anastomosis for Lesions of The Left Colon."

**Dr. John M. Waugh**, Surgical Section, Mayo Clinic; Assistant Professor of General Surgery, University of Minnesota Graduate School of Medicine, Rochester, Minnesota.

and  
**Dr. Monford D. Custer, Jr.**, Fellnw in Surgery, Mayn Clinic, Rochester, Minnesota.

4:30 Address: "Treatment of Chronic Alcoholism."

**Dr. Giorgio Lolli**, Medical Director, Yale Plan Clinics, Yale University Schnnl nf Medicine, New Haven, Connecticut.

5:00 Address: "Malaria and Advances in Treatment."

**Dr. James A. Shannon**, Director, Squibb Institute for Medical Research, New Brunswick, New

Jersey; recently Professor of Pharmacology, New York University College of Medicine, New York, New York; formerly in charge of the testing program of new antimalarials under the U. S. Board for the Coordination of Malarial Studies.

#### ASSEMBLY DINNER

The Gold Room—Hotel Jefferson—Informal  
7:00 P. M.

For members of the professinn, their ladies  
and friends.

#### Program

Welcome, and presentation of President **Dr. James E. Paullin**, Atlanta, Georgia, by

**Dr. Carl F. Vohs**, President, St. Louis Medical Society, St. Louis, Missouri; Assistant Professor of Clinical Orthopedic Surgery, St. Louis University School of Medicine; Associate Orthopedist, The University Hospital; General Chairman, 1947 St. Louis Assembly of the Interstate Postgraduate Medical Association of North America.

#### Addresses

"Medical Citizenship."

**Dr. James E. Paullin**, President, Interstate Postgraduate Medical Association of North America; Professor of Clinical Medicine, Emory University School of Medicine, Atlanta, Georgia; Honorary Consultant in Internal Medicine to the Surgeon General, U. S. Navy.

Presentation of **Dr. Herman Kretschmer**, President-Elect of the Interstate Postgraduate Medical Association of North America; Professor of Urology (Surgery), University of Illinois College of Medicine, Chicago, Illinois.

"Use Your Head."

A baffling lecture demonstration on Memory and Telepathy.

**Dr. Bruno Furst**, New York City; LL.D., University of Bonn; Associate Professor of Psychology at Masaryk College, Prague, Czechoslovakia, 1933 to 1938; Director, School of Memory and Concentration, New York City, since 1939.

Friday, October 17

8:00 A. M.

8:00 Address: "Cnngential Heart Lesions and Their Treatment."

**Dr. Howard B. Burchell**, Assistant Professor of Medicine, Mayo Foundation, Rochester, Minnesota.

and

**Dr. J. E. Edwards**, Assistant Professnr of Medicine, Mayo Foundation, Rochester, Minnesota.

8:30 Diagnostic Clinic: "Differential Diagnosis, Benign Prostatic Hypertrophy, and Neurogenic Bladders, Various Types."

**Dr. Dalton K. Rose**, Professnr of Clinical Genitourinary Surgery, Washington University School of Medicine, St. Louis, Missouri.

9:00 Diagnostic Clinic: "Diagnosis and Treatment of Tularemia."

**Dr. Lee Foshay**, Professor of Bacteriology, University of Cincinnati College of Medicine; Director of Service, Cincinnati General Hospital, Cincinnati, Ohio.

9:30 Diagnostic Clinic: "Differential Diagnosis and Treatment of Arthritis."

**Dr. Ralph A. Kinsella**, Professor of Internal Medicine and Director of the Department, St. Louis University School of Medicine, St. Louis, Missouri.

10:00-11:00 *Intermission for Review of Exhibits*

11:00 Diagnostic Clinic: "Bronchiogenic Carcinoma."

**Dr. Alton Ochsner**, William Henderson, Professor of Surgery, Tulane University School of Medicine, Chief, Alton Ochsner Medical Foundation, New Orleans, Louisiana.

11:30 Address: "Drugs and Methods for the 'Occasional' Anesthetist."

**Dr. Ralph M. Waters**, Professor of Anesthesiology, University of Wisconsin Medical School, Madison, Wisconsin.

*Noon Intermission*

1:00 P. M.

1:00 Diagnostic Clinic: "Treatment of Hepatic Cirrhosis."

**Dr. Goronwy Owen Broun**, Professor of Internal Medicine, St. Louis University School of Medicine; Director, Resident Staff, St. Mary's Group of Hospitals of St. Louis University, St. Louis, Missouri.

1:30 Diagnostic Clinic: "Somatization Reactions of Anxiety."

**Dr. Franklin G. Ebaugh**, Professor of Psychiatry, University of Colorado School of Medicine; Director, Colorado Psychopathic Hospital, Denver, Colorado.

2:00 Diagnostic Clinic: "Further Observations on Prefrontal Lobotomy in Treatment of Chronic Mental Illness."

**Dr. Edmund A. Smolik**, Assistant Professor of Neurological Surgery, St. Louis University School of Medicine, St. Louis, Missouri.

**Dr. Leopold Hofstatter**, Research Associate in the Department of Neuropsychiatry, Washington University School of Medicine, St. Louis, Missouri.

**Dr. Anthony K. Busch**, Instructor in Clinical Psychiatry, Washington University School of Medicine, St. Louis, Missouri.

2:30-3:00 *Intermission for Review of Exhibits*

3:00 Address: "Favorable and Unfavorable Results of Vagus Nerve Resection for Peptic Ulcer."

**Dr. Waltman Walters**, Mayo Clinic; Professor of

Surgery, University of Minnesota Graduate School of Medicine, Rochester, Minnesota.

3:30 Address: "Foreign Bodies in The Air and Food Passages."

**Dr. Chevalier L. Jackson**, Professor of Laryngology-Broncho-Esophagology, Temple University School of Medicine, Philadelphia, Pennsylvania.

4:00 Diagnostic Clinic: "The Climacteric in Women and Men."

**Dr. August A. Werner**, Assistant Professor of Internal Medicine, St. Louis University School of Medicine, St. Louis, Missouri.

## SPECIAL INFORMATION

### Place of Assembly

The members of the Assembly will have the pleasure of convening in the St. Louis Public Auditorium. Its equipment is modern in every detail and meets every requirement to carry on the Assembly successfully, such as acoustics, seating capacity, large stage, temporary hospital, electrical equipment, etc.

The opening session of the scientific and clinical program will begin promptly at 8:00 o'clock Tuesday morning, October 14, 1947.

### Registration

The registration fee for the four-day session is \$5.00.

Doctors in uniform, internes, graduate nurses, technicians and dietitians will be admitted upon the payment of \$1.00 registration fee. Senior medical students and senior student nurses will be admitted free of charge Friday, October 17, only, and upon presentation of proper credentials at the registration desk.

Guests of the Association (i.e., those appearing on the scientific and clinical program) are requested to register.

Life Members are requested to show their Life Membership cards at the time of registration.

St. Louis physicians are urged to register in advance of the opening of the Assembly, Monday afternoon October 13 at the Hotel Jefferson.

### Place of Registration

The main Registration Department will be at the St. Louis Public Auditorium. This Department will open Tuesday morning, October 14.

**Everyone attending the Assembly must register.** A distinctive badge will be issued to all professional men and women at the time of registration, and a distinctive button will be issued to the senior medical students and senior student nurses. No one will be permitted to attend the scientific and clinical sessions or visit the exhibits unless a badge or button is shown. It is suggested that the badge or button be worn. Your co-operation in this matter is requested.

# Technical Exhibits

## ST. LOUIS ASSEMBLY

### INTERSTATE POSTGRADUATE MEDICAL ASSOCIATION

#### ABBOTT LABORATORIES

Booths 77-78

You are most cordially invited to visit the exhibit prepared for this meeting. Abbott Professional Service representatives in attendance will be glad to discuss with you the newer developments in the antibiotic, anticonvulsant, anesthetic, hormone, sulfonamide, hematinic, allergenic, vitamin, and other fields.

#### ALKALOL COMPANY

Booth 118

This exhibit features Alkalol, the balanced alkaline, saline solution for the treatment of mucous membranes and irritated tissues. It is bland, nontoxic and effective and has been a favorite since 1896. We are also showing Irrigol, a powder which in solution makes an aseptic, slightly astringent vaginal douche. It is widely used also for colonic irrigations and as an effective rectal enema.

#### W. D. ALLISON COMPANY

Booths 202-203

The W. D. Allison Company's exhibit this year will be located in Booths No. 202 and 203 (adjacent to the Refreshment Stand). On display will be furniture designed for the general practitioner and also specialized equipment for the pediatrician, proctologist, etc. Allison services are yours for the asking—see our representatives.

#### A. S. ALOE COMPANY

Booths 8-9-10

The A. S. Aloe Company welcomes you to Booths 8, 9, and 10 where a representative cross-section of Surgical, Laboratory, and Physio-Therapy equipment and supplies will be on display. Also, from the current stocks of the "world's largest surgical supply house" will be shown a large range of government surplus instruments—new, first quality merchandise, fully guaranteed and selling for approximately half of the current list price.

#### AMERICAN HOSPITAL SUPPLY CORPORATION

Booth 119

The American Hospital Supply Corporation will exhibit their complete line of Baxter Intravenous Solutions, Plasma and Transfusion equipment. Notable in this exhibit will be the new Protein Hydrolysate Baxter prepared from bovine blood and conspicuously reaction-free. It can now be offered to the profession in unlimited quantities. American's new Anti-RH serum will also be shown. This is the remarkable new serum that provides accurate RH testing in two minutes or less. Agglutination is not only rapid but clearly visible to the naked eye as well. Various supplies and equipment complete the exhibit.

#### AMERICAN OPTICAL COMPANY

Booths 29-30

The American Optical Company cordially invites each member and guest attending, to visit their exhibit, where they will have on display the very latest developments in the AO Spencer Hb Meter for rapid, accurate determination of hemoglobin.

There will also be the AO Deluxe Refracting Chair Unit complete with precision instruments for diagnosing optical defects and prescribing corrective lenses. Competent AO representatives will be on hand to explain and demonstrate the features of any of these instruments.

#### AMERICAN SAFETY RAZOR CORPORATION

Booth 147

A.S.R. Surgeon's Blades and Handles are instruments a surgeon can trust for keenness, uniformity and dependability. A.S.R. products are backed by a tradition of over fifty years of precision blade manufacture by experienced craftsmen. Visit the A.S.R. Booth to examine these products and discuss your blade problems with our representatives. Also on view is the A.S.R. Sanitary Bed Pan Cover, new, revolutionary, made of paper, easily disposable and guarantees improved sanitary Bed Pan technic. You will be interested to see the various uses to which this versatile cover lends itself.

#### AMES COMPANY, INC.

Booths 69-70

Ames Company representatives will demonstrate Clinitest, Alhutest and Hematest—simplified tests for the detection of urine-sugar, albumin and occult blood. They will be glad to discuss Decholin and Decholin Sodium.

#### ARLINGTON CHEMICAL COMPANY

Booth 201

The Arlington Chemical Company will exhibit some of their principal pharmaceutical products and also their full line of Allergenic Extracts, both for diagnosis and treatment. Dr. J. H. Frazer, Medical Director, will be in charge and also in attendance at the exhibit.

#### THE ARMOUR LABORATORIES

Booths 94-95

The Armour Laboratories, a pioneer in the field of Endocrinology, will welcome members of the Postgraduate Medical Assembly to visit the Armour exhibit in booths 94 and 95. If you have not received your copies of booklets on *The Thyroid Gland, Function and Dysfunction of the Biliary System* and *The Armour Atlas of Hematology*, you may secure them at the Armour Booth.

**AYERST, McKENNA & HARRISON**

Booths 155-156

"Premarin" is a potent preparation of naturally occurring, water-soluble equine conjugated estrogens containing sodium estrone sulphate as one of its estrogens. "Premarin" combines a high degree of potency with convenience of administration and is well tolerated by the patient. It is supplied with the approval of the Research Institute of Endocrinology, McGill University, and is accepted by the Council on Pharmacy and Chemistry of the American Medical Association.

**BARD PARKER CO., INC.**

Booth 151

The Bard Parker exhibit will feature rib back surgical knife blades, surgical knife handles including long handles for deep surgery, laboratory handles and hysterectomy and eye handles; Bard Parker germicide, a sporicidal solution, instrument sterilizing containers; Chlorophenyl, an ideal office instrument disinfectant; hematological cases for obtaining bedside blood specimens, and pipettes.

**BARRY LABORATORIES, INC.**

Booth 228

The Barry Laboratories will display products manufactured by its Biological Division which will illustrate advancements and improvements made in the line of injectable pharmaceuticals, and allied specialties. The Allergy Division of the Barry Laboratories, Inc., will display and demonstrate the latest methods of skin testing allergy patients, and demonstrate a complete follow-through procedure enabling the general practitioner to treat his allergy patients in accordance with their individual requirements as demonstrated by the skin test reactions.

**BAUER & BLACK**

Booth 54

Bauer and Black, Division of the Kendall Company, will exhibit the Curity line of products for hospital and office use. The Ostic Plaster line, Sutures, Surgical Dressings and Adhesives may be discussed with men who are trained to help doctors solve any problems which may pertain to the use of such products in hospital or office management of patients. Doctors may register for a complete bibliography and extract service of the literature on a number of pre-operative and postoperative variables in surgery. Any printed literature or booklets which Bauer & Black has available will be sent upon request to visitors. Two new products, Kerlix, a completely different type of exceptionally soft and resilient gauze, and an improved radiopaque sponge which can be used with portable x-ray equipment, will be available in sample form.

**W. A. BAUM CO., INC.**

Booth 205

Booth 205 will display the four latest models of the Lifetime Baumanometer. Doctors interested in infant, child and leg size blood pressure cuffs will find a complete display. We will welcome the opportunity

to be of every service possible in connection with your blood pressure measurement problems.

**BECTON, DICKINSON & CO.**

Booths 145-146

There will be on display a complete line of hypodermic syringes and needles, clinical thermometers, ACE Bandages, asepto syringes, and a complete line of B-D representatives will be on hand to demonstrate this new method of taking blood specimens for all practical purposes.

**BILHUBER-KNOLL CORP.**

Booth 104

Visit the Bilhuber-Knoll Corporation exhibit for the latest developments in their fine medicinal chemicals: Metrazol-analeptic and antianoxiant; Bromural-sedative and mild hypnotic; Calciphos-calcium therapy; Theocalcin-myocardial stimulant and diuretic; Octin-antispasmodic; Oenethyl—new vasopressor, and other dependable products. These are prescribed alone and in combinations that meet the requirements of the individual patient. They will welcome your discussions on these fine medicinal chemicals.

**BIRTCHER CORPORATION**

Booth C

The Birtcher Corporation, Los Angeles, manufacturer of short wave diathermies, electro-surgical units, the famous Hyfrecator, spot-quartz ultraviolet lamps, Cuflex self-retaining electrodes, orificial ultraviolet generators, Caput electrodes and a complete line of accessories. Distributed through 500 surgical supply houses in the United States and in 56 foreign countries.

**J. BISHOP & COMPANY PLATINUM WORKS**

Booth 163

The complete line of Bishop stainless steel needles will be on display—with special emphasis on the Albalon plastic bulb needle and the Tube Syringe, developed by Bishop. Of special interest to physicians will be a presentation of the needle standardization proposed by the American Hospital Association and approved by the American College of Surgeons. Specially trained factory representatives will be in attendance to demonstrate Bishop Products.

**THE BLAKISTON COMPANY**

Booth 127

Here is an unusual exhibit of new and standard medical books for the progressive physician. Important titles integrating the postwar advances in many practical fields are being shown. Ask to see: Merritt, Mettler & Putman, *Clinical Neurology*; Hawk, Oser, & Summerson, *Practical Physiological Chemistry*; Strecker, Ebaugh & Ewalt, *Practical Clinical Psychiatry*; Dyke, *Recent Advances in Clinical Pathology*, among many others.

**BORCHERDT MALT EXTRACT COMPANY**

Booth 168

New, more palatable ways of treating nutritional deficiencies in infants and children will be featured by Borchardt Malt Extract Co. Dri-Malt Soup Extract, an easier-to-use laxative modifier of milk for consti-

pation in infants will be shown. New Prescriptions using Urolithia for treating chronic urinary disorders in older patients will be described by Cobbe Pharmaceutical Co. Division.

#### THE BORDEN COMPANY

Booth 97

We invite your attention to PORTOLAC, a new especially-formulated blend of intact proteins and high protein products derived from animal and vegetable sources. PORTOLAC is supplemented with choline and the amino acid cystine. PORTOLAC is indicated in high protein therapy in conditions requiring increased dietary protein of optimum nutritional value. Likewise exhibited will be GERILAC, a vitamin-fortified powdered milk for well-rounded nutrition in convalescence, pre- and postoperative diets, geriatrics, pregnancy and lactation, and soft and liquid diets.

#### BREWER & COMPANY, INC.

Booths 166-167

This exhibit consists of specialties, centering around THESODATE, the original enteric-coated tablet of Theobromine sodium acetate, and LUASMIN, a combination of Theophylline sodium acetate, phenobarbital and ephedrine for the treatment of asthma. Also, Brewer Capsules and Ampuls, other specialties and standard pharmaceuticals manufactured by Brewer & Company, Inc., including a complete line of vitamin preparations for internal use and injection. Gel-lets, the newest mode in oral vitamin therapy, are also featured.

#### BRISTOL LABORATORIES

Booth 236

The Bristol Laboratories exhibit will be devoted to the display of antibiotics and pharmaceutical products. Samples of Alminate and Barbonate, new antacid products, and Aminogran, a new amino acid product will be distributed to the medical profession. Qualified representatives will be on hand to assist with any inquiries. Literature describing Bristol products will be available.

#### BRISTOL-MYERS COMPANY

Booth 33

Bristol-Myers Co., New York, cordially invite you to visit their booth where Bristol-Myers' representatives will be in attendance to extend a hearty welcome to all visitors and to answer any questions pertaining to their various products—Sal Hepatica, Mint-Rub, Trushay, Ipana Tooth Paste.

#### BROOKS APPLIANCE COMPANY

Booth 34

The Brooks Appliance Company will have on display a complete line of Bandages, Proctological Instruments, Syringes, Needles and Elastic Stockings.

Mr. W. C. Ayer will have charge of the exhibit and will describe in detail the technique of applying the new Combination Pressure Bandage, Contura plus Pressoplast, which is used in treating phlebitis and leg ulcers.

#### THE BURDICK CORPORATION

Booth 48

The Burdick Corporation will exhibit their complete line of Physical Medicine equipment. This will include their new approved diathermy apparatus, Ultraviolet and Infra-red Lamps and the Rhythmic Constrictor for the treatment of peripheral vascular conditions. The new low voltage unit for muscle stimulation will also be shown. Doctors are invited to register for a copy of the syllabus, "A hooklet of clinical information on physical medicine."

#### BURROUGHS WELLCOME & COMPANY (U.S.A.) INC.

Booths 210-211

Burroughs Wellcome & Co., New York, cordially invite physicians to their exhibit of a representative group of fine pharmaceuticals and chemicals. Of particular interest are 'Nutragest,' the palatable dietary compound containing the amino acids, important minerals, vitamins and carbohydrates; DIGOXIN, a pure, stable crystalline glycoside of Digitalis lanata, combining uniform potency with rapidity of action; 'Wellcome' Globin Insulin, the action of which begins moderately quickly and persists for sixteen or more hours, sufficient to cover the period of maximum carbohydrate intake.

#### CAMBRIDGE INSTRUMENT COMPANY, INC.

Booth 64

Cambridge Instrument Company, Inc., New York, will exhibit its cardiac diagnostic instruments, including the Cambridge "Simpli-Trol" portable Electrocardiograph and Electrocardiograph-Stetograph, the portable Cambridge Plethysmograph, and the Cambridge Electrocardiograph for recording heart border motion—all operated by electric light supply current. Also on display will be the new Cambridge Control Terminal—Lead Assembly for use in recording Unipolar Chest Leads and Augmented Unipolar Limb Leads as well as the new pocket-size Cambridge Amplifying Stethoscope.

#### CAMEL CIGARETTES

Booths 234-235

CAMEL Cigarettes will present a dramatic full color review of their recent medical research on smoking as well as the details of the nationwide survey showing that "More Doctors Smoke Camels Than Any Other Cigarette." Another panel will illustrate the absorption of nicotine in the respiratory tract. Representatives will be present.

#### CAMERON HEARTOMETER COMPANY

Booth 219

See the improved Heartometer, a scientific precision instrument for accurately recording systolic and diastolic blood pressures, also furnishing a permanent graphic record of the pulse rate, disturbances of the rhythm, myocardial response, the action of the valves, as well as peripheral vascular circulation. The Heartometer clearly reveals heart disturbances in both early and advanced stages, and is of great value in checking the progress of medication and treatment.



**CAMERON SURGICAL SPECIALTY COMPANY**

Booth 204

See the new Cameron Cauterodynes and Cauteradios for Electro-coagulation, Electro-surgery; Coagula-lair-Sigmoidoscope; Electro-Diagnostosets; Flexible Gastrosopes; Bronchoscopes-Exophagoscopes-Laryngoscopes; Mirrolite; Binocular Spectacle Loupe; Magni-scope and other specialties.

**S. H. CAMP & COMPANY**

Booths 6-7

S. H. Camp & Company, Jackson, Michigan, will display a complete line of Camp Anatomical Supports for prenatal, postnatal, visceroptosis, sacro-iliac, hernia, and other specific conditions. Experts from the Camp staff will be in attendance to answer questions pertaining to the scientific application of these supports and to advise regarding the availability of them in authorized service departments of stores throughout the country.

**CARNATION COMPANY**

Booths 206-207

You are invited to visit the Carnation Company booth where you will see an attractive display presenting some interesting information on the various uses of Carnation Vitamin D Evaporated Milk for infant feeding, child feeding and general diet purposes. The method by which Carnation Milk is generously fortified with Vitamin D-400 U.S.P. units per reconstituted quart will be explained. Valuable literature will also be available for distribution.

**CIBA PHARMACEUTICAL PRODUCTS**

Booths 57-58

Ciba Pharmaceutical Products, Inc., Summit, New Jersey, invite physicians to visit their exhibit for full information, literature and samples of PYRIBENZAMINE. Ciba's anti-histaminic and anti-allergic drug will be available during the Interstate Postgraduate Medical Meeting. The clinical effectiveness and relative low incidence of side reactions with PYRIBENZAMINE warrant trial of this drug in allergic cases.

**COMMERCIAL SOLVENTS CORPORATION**

Booths 224-225

The modern-day penicillin armamentarium is to be featured: Crystalline Penicillin G Potassium Salt, Crystalline Penicillin G Sodium Salt, Crystalline Penicillin G Potassium in Oil and Wax, and Tablets Buffered Penicillin. Also displayed will be the new C.S.C. Disposable and Permanent Syringes for administration of Penicillin in Oil and Wax. Descriptive literature covering these preparations will be available outlining the principal uses and dosages.

**CUTTER LABORATORIES**

Booth 72

You'll see displayed at Cutter Laboratories Booth No. 72 the most recent developments in Human Blood Fractions Products—Fibrin Film and Fibrinogen Coagulum. Also shown and available to you now are the other Fractions: Immune Serum Globulin, Albumin, Fibrin Foam & Thrombin, Hypertussis and Plasma. Too, we'd like you to stop by and see the

Cutter Penicillin Specialties which include a Luer-like Disposable Syringe containing 3,000,000 units Penicillin in a really fluid oil and wax preparation.

**DAVIES, ROSE & COMPANY, LTD.**

Booth 230

The availability of our Quinidine Sulfate Tablets has been quite a perplexing problem for physicians, as the Government had to restrict the purchase of the salt and the sale of the tablets because of the occupation of Java by the enemy during the war. Java, as is well known, is the principal source of Cinchona Bark, from which natural Quinidine is derived. A visit to our booth will give the physician an opportunity to hear the last word on the Quinidine situation.

**DAVIS AND GECK, INC.**

Booth A

Davis and Geck, manufacturers of sterile surgical sutures will present a program of films on surgery in Booth A. These films selected from the Surgical Film Library represent twenty years of research and development in the field of visual education as applied to surgical technic. The library which contains films on every approved phase of surgery is constantly expanded to include new and improved operative procedures. Programs of films to be shown will be available at the Booth and may be obtained from their representatives. Mr. Clyde Geisel will be in charge of the exhibit.

**F. A. DAVIS COMPANY**

Booth 49

Interesting new books and new editions you will wish to examine at Booth No. 29: *Reconstructive Surgery*—May; *Disease of the Gallbladder*—Behrend; *Rhinoplasty*—Maliniac; *Diseases of the Chest*—Judd; *Gonioscopy*—Troncoso; *Arthritis*—Bach; *Clinical Radiology*—Pillmore; *Therapeutics of Infancy and Childhood*—Litchfield and Dembo; *Clinical Tuberculosis*—Goldberg; *Clinical Cystoscopy*—McCrea; *Cardiovascular Disease*—Stroud; *Dermatology in General Practice*—Greenbaum; *Clinical Neurology*—Alpers; *Treatment in General Medicine*—Reimann; *Acute Medical Disorders*—Murphy; *Injection Treatment for Varicose Veins and Hemorrhoids*—McPheeters; *The Cyclopedia of Medicine, Surgery and Specialties*—Piersol and Bortz; *Pre- and Postoperative Care*—Tourish and Wagner.

**DEPUY MANUFACTURING CO.**

Booth 153

DePuy Manufacturing Co. will exhibit for your consideration Fracture Appliances which will interest the profession, splints, bone plates, screws, Lorenzo screws and the new sterilizing rack for plates and screws. You will be welcome at Booth 153.

**DEVEREUX SCHOOLS**

Booth 14

Devereux Schools provide the physician with facilities for the education and treatment of children having academic or emotional difficulties. Twelve Devereux Schools in Pennsylvania and California offer a con-

trolled environment and modern training shaped to the needs of each child. A psychiatrist, physician and psychologist, all in residence, cooperate with the referring physician in his plans for the child's training and care. Representatives at Booth 14 will gladly answer questions or discuss how Devereux may serve you and your patients. John M. Barclay in charge.

#### THE DEVILBISS COMPANY

Booth 93

Encouraging reports relative to spraying or the inhalation of penicillin, streptomycin and other substances, make the DeVilbiss exhibit of pertinent interest. Atomizers, nebulizers, vaporizers, and powder blowers for home use as well as office treatment, will be displayed. There are types for any treatment where spray application or inhalation is to be employed.

#### DOAK COMPANY, INCORPORATED

Booth 170

Diaporal, parenteral colloidal preparations for the treatment of anemia, arthritis, and syphilis, all of interest to the specialist and general practitioner, will be shown. The well known Derma Specialties such as Salinidol, Dandrucide, Cottar, Sulfur Cream and Myeogan for various skin conditions will be demonstrated by experienced detail men.

#### THE DOHO CHEMICAL CORPORATION

Booth 98

The makers of AURALGAN are introducing at this meeting, their new sulfa drug preparation O-TOS-MO-SAN, indicated in the treatment and control of chronic suppurative ears. Our representatives will be happy to explain, in detail, the workings of these medications. Also, to distribute our latest series of three Anatomicopathologic Charts of the Ear, in color, suitable for framing.

#### DUKE LABORATORIES, INC.

Booth 91

At Booth No. 91 Duke Laboratories, Inc., will exhibit Elastoplast, the stretchable adhesive surfaced bandage suggested for compression and support; Medioplast, individually wrapped and sterilized, for minor injuries; Nivea Creme, Nivea Skin Oil and Basis Soap, The Prescribers' Cosmetics.

#### DUREX PRODUCTS, INC.

Booth 40

Durex Products, Inc., this year celebrates its 20th anniversary. Its exhibit includes a contraceptive jelly and cream, namely Lactikol Jelly and Lactikol Creme, both of which are accepted by the Council on Pharmacy of the American Medical Association. A new development in occlusive diaphragms, the Bow-Bend is also being shown; it has the advantage of requiring no inserter, since it is self-positioning and is also useful in a variety of mild cases of cystocele, rectocele, retroversion and others, deviating somewhat from the normal. The Bow-Bend is available also in a set with a tube of jelly and cream for the convenience of the doctors. A complete line of equipment and materials for contraceptive treatment is included.

#### E & J MANUFACTURING

Booth 52

The E & J Manufacturing Co. will display the newest models of the E & J Resuscitator-Inhalator-Aspirator. Interesting demonstrations on new developments in mechanical resuscitation will also be made by the E & J personnel. These new E & J instruments are especially designed for treatment of the most desperate cases of failed respiration. Both the mask and the intratracheal technic will be demonstrated. Reprints covering the recent research in this field will be available to visitors.

#### EATON LABORATORIES, INC.

Booths 55-56

Furacin solution, the Furacin preparation, will be exhibited at the Eaton Laboratories booth. The new vehicle for this topical antibacterial agent was formulated in response to the demand for a liquid for use when the ointment form is undesirable. Furacin Solution has the same wide antibacterial spectrum as has Furacin Soluble Dressing, including many gram-negative and gram-positive organisms. Furacin Soluble Dressing, the topical antibacterial agent, will also be exhibited.

#### ELECTRO-PHYSICAL LABORATORIES, INC.

Booth 152

Electro-Physical Laboratories, Inc., of New York, cordially invite the members attending the convention to see at first hand—the CARDIOTRON—the First Direct-Writing Electrocardiograph—which uses a Jeweled Point—which gives complete resolution and fine detail. They will also feature their—Electroencephalograph, Shock Therapy Apparatus, and Special Electronic Equipment. Experienced members of their staff will be on hand to demonstrate, answer questions, and take cardiograms for those interested.

#### J. H. EMERSON COMPANY

Booth 220

Anyone who has taken care of polio patients in an "iron lung" will recognize the importance of the new RESPIRATION DOME shown by the J. H. Emerson Co. This attachment keeps a patient breathing comfortably while the respirator is opened for minutes or hours, to give baths, hot packs, or other bodily care. This important new development and also the Emerson Hot Pack machine and other apparatus will be displayed at Booth 220.

#### ETHICON SUTURE LABORATORIES DIVISION

OF JOHNSON & JOHNSON

Booth 92

Ethicon Suture Laboratories presents a complete line of sutures for every surgical procedure. Of greatest interest is Ethicon's New Bonded Catgut, Tru-Gauged and Tru-Chromicized with up to 30% greater strength. Also exhibited are Ethicon's Eyeless Atraumatic Needles for minimal tissue trauma and Ethicon's Black Braided Silk on spools and in tubes. Of special interest is Ethicon Braided Tantalum Wire, the newest development in metallic sutures.

**FARNSWORTH LABORATORIES**

Booth 35

Mr. M. G. Farnsworth and Mr. R. R. Grandy, representing.

**FELLOWS MEDICAL MANUFACTURING CO., INC.**

Booth D

Showing the FELLOWS Line of ASTHMATIC PREPARATIONS: Hedron Tablets—for the allergic type of asthma; Scopen Tablets—designed for the patient with a neurotic component in the asthmatic syndrome; ArBeC suppositories—the sedative suppository for the asthmatic. The method of dealing with the idiosyncrasies of the patients by proper selection of medication will be illustrated.

**H. G. FISCHER & CO.**

Booth 126

Visitors to the 1947 meeting of the Interstate Postgraduate Medical Association are cordially invited to visit our FISCHER display, and to inspect the new units of FISCHER X-ray and Electro-Surgical-Medical Apparatus to be shown. FISCHER apparatus is characterized by new levels of precision design and of convenience and efficient operation. Members of the Fischer organization will be present at all hours to answer questions and to demonstrate features of Fischer design and performance. You will be welcome at FISCHER Booth No. 126.

**C. B. FLEET CO., INC.**

Booth 39

C. B. Fleet Co., Inc., cordially invites you to stop at Booth No. 39 for a short visit. Perhaps there is something about PHOSPHO-SODA (FLEET) the pure, stable, aqueous concentrate of the two U.S.P. Sodium Phosphates, you would like to discuss with our representatives.

**FLINT, EATON & COMPANY**

Booth 51

Featuring projections of color photographs and photomicrographs illustrating liver pathology, with particular emphasis on cirrhosis, fatty degeneration and similar conditions associated with the choline deficiency. Taste Syrup Choline Dihydrogen Citrate (Flint) at the booth. This palatable form of choline is outstanding in the prophylaxis and treatment of conditions leading to hepatic cirrhosis.

**FOLEY MANUFACTURING COMPANY**

Booth 216

There is an easy way to strain foods! Doctors are cordially invited to visit exhibit 216 and see how quickly fresh cooked foods can be strained or pureed through the Folev Food Mill. It is excellent for all infant and adult diets.

**E. FOUGERA AND CO., INC.****VARICK PHARMACAL CO., INC., DIVISION**

Booths 73-74

The manufacturers of DIGITALINE NATIVELLE plan an interesting and informative exhibit on heart disease. Of special interest are the phonographically reproduced heart sounds of various valvular lesions. Physicians are cordially invited to sit and listen via individual head sets, to the accurate reproductions

of many abnormalities such as auricular fibrillation, gallup rhythm, pre-systolic murmurs, etc. Enlarged full-color kodachromes of many gross cardiac specimens and photomicrographs of cardiac pathology will be displayed. Literature and information on DIGITALINE NATIVELLE, in the treatment of congestive heart failure, auricular fibrillation, and flutter, will be available.

**GARDNER MANUFACTURING CO.**

Booth 131

The exhibit will show hospital bedside tables, ruggedly constructed with a variety of baked-enamel finishes; radiator enclosures—by the leading manufacturer. These are designed for hospitals and sanatoriums and are scientifically custom-built to increase efficiency of heating unit, keep rooms cleaner, longer, and add humidity; electric fly screens and insect electrocutors. Other items of interest will also be on display.

**GERBER PRODUCTS COMPANY**

Booth 129

Gerber Products Co. extends a cordial invitation to you to visit its exhibit of Strained Foods, Junior Foods and Baby Cereals at Booth No. 129. Recent revisions of their service literature will be displayed. They especially invite your attention to the use of their strained foods and cereals for adult special diets requiring foods of a low fiber content. Special diet lists, for instructing patients, and special diet recipes will be available.

**OTIS E. GLIDDEN & CO., INC.**

Booth 115

Our representatives will appreciate the opportunity to present Zymenol, an emulsion with Brewers' Yeast, for effective bowel management without irritant, habit-forming drugs, dehydrating purgatives or bulking agents. Teaspoonful dosage assures a minimum liquid petrolatum intake not likely to interfere with digestive processes or fat soluble absorption, and avoids leakage. Zymenol and descriptive literature on request.

**GRADWOHL LABORATORIES**

Booths 113-114

This exhibit calls attention to the widespread activities of this organization. The scope of the work covers the following: The manufacture of laboratory reagents, standardized and ready for use; training courses for technicians; oldest school of this type in this country; publication of *Laboratory Digest*, monthly review of the latest literature on technic and interpretation of laboratory findings; publication of the standard textbook (Mosby, publisher) entitled: *Laboratory Methods and Diagnosis* (4th Edition, three volumes, now in press); and a complete line of blood grouping sera, reliable, highly potent. Ask for *Story of Blood Groups*. A free copy mailed on registration.

**GRUNE & STRATTON**

Booth 223

Grune & Stratton shows books in many branches of medicine and surgery, among them Behrman's

*Dermatologic Clues to Internal Disease.* Two ATLAS publications will be ready: Rubinstein and Davis' *Stereoscopic Atlas of Neuroanatomy* and Berson's *Atlas of Plastic Surgery*. Ideal for review are the *Progress Volumes*, published in the field of Gynecology (Meigs and Sturgis, editors) and Neurology and Psychiatry (Speigel, editor).

#### HAMILTON MANUFACTURING CO.

Booths 82-83-84

The new, improved Hamilton All Purpose Examining Table will be on display. This table is specially designed to get all standard examining positions. In our regular equipment, complete suites of our Steel-tone and Nu-Tone will be shown, including examining tables, treatment cabinets, instrument cabinets, stools, and waste receivers. Steel-tone is built of heavy steel, electrically welded construction, finished in white, chip-proof Dupont Delux. Nu-Tone is made of beautifully matched woods—Hamilton's de luxe furniture.

#### HANOVIA CHEMICAL & MANUFACTURING CO.

Booth 161

For a long time doctors have marvelled at the value of black light in diagnostic work. A new Hanovia model of this type will be on display, which will be worth your while to investigate. In addition Hanovia's complete line of self-lighting ultraviolet lamps will be on display for official and body radiation, Sollux radiant heat lamps, short wave diathermy equipment and Safe-T-Aire Lamps for the destruction of air-borne bacteria. Competent and courteous representatives at your disposal.

#### CHR. HANSEN'S LABORATORY, INC.

"THE 'JUNKET' FOLKS"

Booth 61

The importance of rennet in infant and adult nutrition and the value of rennet custards in both normal and restricted diets will be explained. Enlarged photos illustrate the action of the rennet enzyme. Free literature is available describing dietary applications of rennet products. All physicians will be presented with complimentary packages of "Junket" Rennet Powder and "Junket" Rennet Tables.

#### HARROWER LABORATORY, INC.

Booth 231

The Harrower exhibit features Mucotin, the new treatment for peptic ulcer. This new treatment was announced by Leo L. Hardt, M.D., Clinical Professor of Medicine, Loyola University, earlier this year. The Harrower exhibit presents visual proof, by means of gastroscopic illustrations, of the ulcer coating properties of this new product. In addition, a case history is detailed and gastroscopic evaluation of commonly used antacids is presented.

#### H. J. HEINZ CO.

Booths 85-86

H. J. Heinz Company is displaying their Strained Foods for infants and Junior Foods, especially designed for intermediate feeding. Their representatives would appreciate your recommendations regard-

ing these foods. They are presenting a new publication, *The Nutritive Value of Vegetables*. Examine, then register for it. A reminder—if desired, also register for the 12th edition *Nutritional Charts and Nutritional Observatory*.

#### PAUL B. HOEBER, INC.

Booth 44

The Hoebler exhibit, always interesting for its display of important monographs and specialized works, will this year exhibit several outstanding new titles specifically designed for the family physician. Among them are Mengert's highly-successful *Postgraduate Obstetrics*, Nielson's *Clinical Neurology*, Schwedell's *Clinical Roentgenology of the Heart*, Gesell's *Developmental Diagnosis* (New 2nd Edition), Mazer and Israel's *Menstrual Disorders and Sterility* (New 2nd Edition), and Bierman's *Physical Medicine in General Practice* (New 2nd Edition). In addition, every distinguished Hoebler publication now in print may be seen along with advance proofs of important forthcoming books.

#### HOFFMAN-LA ROCHE, INC.

Booth 193

Roche representatives will be in attendance to discuss PROSTIGMIN and its many uses, particularly those of interest to the surgeon; BEROCCA-C, the new B-complex and vitamin C preparation in ampul form for immediate use by injection; PER-OS-CILLIN, the specially buffered penicillin tablet for oral use; and other Roche specialties in which visitors may be interested.

#### HOLLAND-RANTOS CO., INC.

Booth 221

Koromex Contraceptive Specialties: The Koromex Set Complete, a convenient unit, diaphragm, introducer, jelly and cream; Nylmerate Jelly contains a phenyl mercuric acetate; a new and effective treatment for trichomoniasis and non-specific leukorrhea; Electro-Jelly, for use with electrocardiographic and electroencephalographic equipment in shock therapy. Representatives will be pleased to discuss products of particular interest to you.

#### HYGEIA NURSING BOTTLE CO., INC.

Booth 50

You are cordially invited to visit Booth No. 50 to see the advantages of the new improved Hygeia Nursing Bottle Unit. Learn why prescribing the Hygeia unit—including bottle, nipple, and cap—will help mothers overcome feeding problems. Mr. Charles H. Clark will be in attendance.

#### INTERCHEMICAL CORPORATION

BIOCHEMICAL DIVISION

Booths 172-173

The Biochemical Division presents a newly perfected protein hydrolysate—"AMINO ACIDS"—I. C. Lyophilized—for intravenous alimentation. This product is stable, rich in essential amino acids, high in amino acid nitrogen, and well tolerated as a 10% solution. Representatives will explain additional advantages which commend the preparation for speci-

cation whenever nitrogen equilibrium is to be regained or maintained by intravenous infusion. See how lyophilization is performed, at Booths No. 172-173.

**IRWIN, NEISLER & COMPANY**

Booths 176-177

A presentation of a new research development in the treatment of hypertension called "VERTAVIS," which is attracting wide interest throughout the medical profession, will be featured in our exhibit. Featured also will be "CHOBILE," a new approach to the medical management of biliary malfunctions. Irwin, Neisler service representatives will be present to assist visiting physicians whenever possible.

**JOHNSON & JOHNSON**

Booths 212-213

Featured this year by Johnson & Johnson is a display of "Hemo-Pak" hemostatic absorbable dressings prepared from oxidized gauze and cotton. Many other products of special interest are on display and Johnson & Johnson representatives will welcome the opportunity to be of service to you.

**JONES METABOLISM EQUIPMENT CO.**

Booth 157

The Jones Metabolism Equipment Co., of Chicago, will exhibit and display the Jones Waterless MOTOR-BASAL and SUPER MOTOR-BASAL Metabolism Units. The exhibit will be under the direction of Mr. Jack Reynolds, sales manager, and a staff of trained technicians and assistants.

**KELLEY-KOETT MANUFACTURING CO.**

Booths 132-133

At this meeting many doctors will be seeing for the first time the smooth KELEKOTE finish on two outstanding Keleket units—the Techron Control and the Type "B" Motor-Driven Tilting Table. This modern finish is extremely hard and will not pit or chip, thereby assuring easy and thorough cleaning. The soft warm tone of KELEKOTE is pleasant to both doctor and patient and will appear on all Kelley-Koett quality-engineered x-ray equipment.

**KIDDE MANUFACTURING CO., INC.**

Booth 194A

In Booth No. 194A the new KIDDE-Utero Tubal Insufflator with GASOMETER pressure control—completely safe—gravity pressure control—simple operation—single control. Requires only small cartridge of carbon-dioxide gas. Provides diagnostic and therapeutic use of carbon-dioxide gas or opaque oil. Kymographic record of patency test.

Also on display the KIDDE Dry Ice Apparatus used in treatment of superficial skin lesions.

**H. W. KINNEY & SONS, INC.**

Booths 116-117

Cartose and other Kinney nutritional products will be exhibited at Booths 116-117. Physicians and guests of the Interstate Postgraduate Medical Association are cordially invited to stop and visit with the medical detail representatives in attendance.

**CHARLES B. KNOX GELATINE CO.**

Booth 24

The Knox Gelatine Company exhibit will feature

the special dietary uses of Knox Plain Gelatine. Representatives in attendance will be able to discuss the use of gelatine as a pleasant and useful means of increasing the dietary protein intake.

The new, safe and effective blood plasma substitute "Knox P-20" Intravenous Gelatine Solution will also be displayed.

**LAKESIDE LABORATORIES, INC.**

Booths 27-28

The Lakeside exhibit will feature Mercuhydrin, well tolerated mercurial diuretic; Estrogens, Lakeside; and Emulgen, emulsifying vehicle for penicillin. Representatives will be on hand to describe the applications of these medications.

**LA MOTTE CHEMICAL PRODUCTS CO.**

Booth 20

LaMotte Blood Chemistry Equipment for the physician and Clinical Laboratory will be exhibited with technical representatives in charge to explain its use and many applications in modern practice.

New developments will include equipment for the Thymol Turbidity Reaction; the Copper Sulfate Method for determining specific gravity of blood and plasma; new apparatus for determining Prothrombin Time; and the new Cardiolipin-Lecithin Antigen for the Kline Slide Test for Syphilis.

A visit to the booth and discussion of Blood Chemistry problems with the staff incurs no obligation whatever.

**LAMSON LABORATORIES**

Booth 240

Lamson Appliance for colostomy control; also a modification of same designed for control of sacral colostomies and rectal control when the sphincter muscles are paralyzed or injured in such a way that anal control is absent.

**LEA & FEBIGER**

Booth 96

Lea & Febiger will exhibit among their new works Burch and Reaser's *Cardiology*, Goldberger's *Unipolar Lead Electrocardiology*, Quiring's *Head, Neck and Trunk*, Everhardt & Riddle's *Therapeutic Exercises* and Marshall's *Medical Bacteriology*. New editions will be shown of Joslin's *Diabetes*, Wintrobe's *Hematology*, Gifford's *Ocular Therapeutics*, Boyd's *Pathology*, Holmes & Robbins' *X-Ray Interpretation*. Schwartz, Tulipan & Peck's *Occupational Diseases of the Skin* and other standard works.

**LEDERLE LABORATORIES DIVISION**

**AMERICAN CYANAMID COMPANY**

Booths 41-42

Lederle Laboratories will have on display the new Folic Acid products about which there has been so much interest. Also will be shown the new Purogenated (alcohol-fractionated) Toxoids, representing an entirely new development in this science. Ledinac, a new protein-hydrolysate derived from liver, will also be on display. Physicians will be indeed most welcome at Booths No. 41-42.

**ELI LILLY & COMPANY**

Booths 105-106-107

The Lilly presentation this year features new therapeutic developments and an exhibit which is representative of micro-biological assay methods employed in the determination of vitamins and amino acids. Technicians will demonstrate the specific method used in the assay of thiamin. Many Lilly products are to be on display; representative literature will be available. The attending Lilly medical service representatives will be pleased to assist visiting physicians whenever possible.

**J. B. LIPPINCOTT COMPANY**

Booths 214-215

For those who write and produce technical books in the field of medicine there is imposed a definite obligation to have each printed page present dependable, well-documented facts. It is this recognized mastery of subject matter which lends authority and usefulness to LIPPINCOTT medical books. LIPPINCOTT authors are recognized leaders in their fields. Their writings, based on active clinical experience, fill a definite need in the literature. These books of interest to general practitioners will be on display at Booths No. 214-215 at the 1947 Assembly.

**M & R DIETETIC LABORATORIES, INC.**

Booth 233

M & R Dietetic Laboratories, Inc., will display Similac, a food for infants deprived either partially or entirely of breast milk. Messrs. R. E. Davis, B. C. Palmer, A. E. Brown, A. E. Boodel, and A. O. Caldwell will appreciate the opportunity to discuss the merit and suggested application for both the normal and the special feeding cases.

**THE MACMILLAN COMPANY  
MEDICAL DEPARTMENT**

Booth 169

The Macmillan Company extends a welcome to the members of the Postgraduate Medical Assembly and cordial invitation to visit their exhibit. Publications in all the various fields of medical practice will be shown and made available for your examination. In addition to a substantial list of titles which have become standard because of their excellence throughout the years, several new titles will be shown for the first time. These include: *Addis' Glomerular Nephritis: Diagnosis and Treatment*; *Cornell Conferences on Therapy*, Volume 11; *Goldwater's On Hospitals*; *Menninger's Psychiatry on Trial*; *Smillie's Public Health Administration in the United States*, 3rd Edition; *Walter's Aseptic Treatment of Wounds*.

**MALLINCKRODT CHEMICAL WORKS**

Booth 222

Members of the Postgraduate Assembly and their friends are cordially invited to visit the Mallinckrodt Chemical Works exhibit where will be displayed a limited number of the many prescription chemical compounds manufactured by Mallinckrodt and those medical specialties offered to the profession. The attendants at the exhibit will be glad to discuss the

drugs on display and to answer questions regarding the availability of these chemical compounds.

**MALLON CHEMICAL CO.**

Booth 99

MALLON Division of Dohio Chemical Corp., makers of AURALGAN and O-TOS-MO-SAN, ear medications, are pleased to exhibit their latest product, RECTALGAN, the liquid topical anesthesia in hemorrhoidal and pruritic conditions. This is a new departure from the suppository and ointment preparations. Our representatives will be pleased to furnish complete information and samples at their booth.

**MALTBIE CHEMICAL CO.**

Booth 31

Professional Service representatives of the Maltbie Chemical Co. will be in attendance to explain selected products which include the newer concepts of diarrheal control—LUBISMIN; the physiological approach to the management of Biliary disease—CHOLANOX; the synchronized three-fold therapy of gastrointestinal dysfunctions—LUSYN; and the unique xanthine therapy for cardiovascular disease—CALPURATE.

The Maltbie Chemical Co. cordially invites you to visit Booth No. 31.

**MALTINE COMPANY**

Booth 108

Two new developments from the Research Laboratories of The Maltine Company are being exhibited. Physicians are invited to stop at the booth where literature and samples of Cellotilyl, the first bulk laxative in tablet form and Nitramac Tablets, amino acids for oral administration, are available.

**MEAD JOHNSON & COMPANY**

Booths 195-196

Amigen and Protolysate will be on display at the Mead Johnson exhibit at your Interstate Postgraduate Medical Association of North America meeting. Mead Johnson has pioneered the amino acid field commercially; the products have been described in more than one hundred and forty articles in the medical literature; this year they are available. Trained representatives will be at the Mead Exhibit to discuss details of the new amino acid products. Shown also will be Dextri-Maltose Pabulum, Pabena, Oleum Percomorphum and the other Mead Products used in infant nutrition. Protenuum, a new high-protein product, will be displayed. Also Lonolac for low-sodium diets.

**MEDCO PRODUCTS COMPANY**

Booth B

You are cordially invited to visit our booth featuring TECA hydrogalvanic apparatus, used extensively by Army, Navy and Veterans institutions, also numerous leading physicians and hospitals. TECA therapy has proved effective in resistant arthritis, rheumatism, neuritis, etc. Obtain full information from our courteous, specially-trained representatives.

**MEDICAL FABRICS, INC.**

Booth 13

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**PET MILK SALES CORPORATION**  
Booths 100-101-102-103

An actual working model of a milk condensing plant in miniature will be exhibited by the Pet Milk Company. This exhibit offers an opportunity to obtain feeding, and the time-saving Pet Milk services available to physicians. Miniature Pet Milk cans will be given to the physicians who visit the Pet Milk booth.

**PHILIP MORRIS & CO., LTD., INC.**  
Booth 150

Philip Morris & Company will demonstrate the method by which it was found that Philip Morris cigarettes in which diethylene glycol is used as the hygroscopic agent are less irritating than other cigarettes. Their representatives will be happy to discuss researches on this subject and problems on the physiological effects of smoking.

**PICKER X-RAY CORPORATION**  
Booths 186-187-188

The Picker X-ray Corporation will exhibit the 100 milliamper "Century" Unit complete with the new type monitor control. This unit permits radiography and fluoroscopy in all positions from the Trendelenberg to the Vertical. There will also be on display the Picker Vertical Fluoroscope embodying an orthodiagraphic attachment of the latest design.

**PITMAN-MOORE COMPANY**  
Booths 109-110

The Pitman-Moore display will feature three recent research developments: Influenza Virus Vaccine, a triple sulfonamide suspension in the celebrated Pitman-Moore Magmoid line, and a new antacid known as Alupep. The sulfonamide mixture, named Magmoid Dimerzole, is designed to minimize the danger of crystalluria. The antacid has the advantage of combining speedy yet sustained action without danger of over-alkalization. Members of the Pitman-Moore Scientific staff will be on hand to answer technical questions.

**POLORIS COMPANY, INC.**  
Booth 194

The Poloris Company's exhibit will provide the visiting Assembly members with literature and professional samples of Poloris Dental Poulitice. Poloris is an ethically promoted local medicinal counter-irritant widely prescribed by the dental profession for the relief of pain and soreness due to irritation of teeth and gums.

**RADIUM EMANATION CORPORATION**  
Booth 71

The Radium Emanation Corporation invites you to Booth No. 71 where we will exhibit a wide variety of instruments and applicators used in modern radium therapy, including permanent and removable LEAK-PROOF radon seeds. Our representatives will be available to explain this equipment and its usage.

**RARE CHEMICALS, INC.**  
Booth 130

Preparations exhibited by Rare Chemicals, Inc., will

include Acidolate (non-lathering liquid) and Dermolate (new lathering cake), both non-irritating skin detergents; Arsenoferrate, palatable hematinic; Encupin, local anesthetic with prolonged analgesic action; Gitalin, digitalis preparation; Salysal, anti-rheumatic analgesic, and Testosterone propionate "Rare Chemicals," the Council-Accepted androgenic preparation.

**REED & CARNRICK**  
Booths 159-160

Meprane, a new synthetic estrogen which affords prompt relief of menopausal symptoms and imparts a sense of well-being without unpleasant side reactions, is being featured at the Reed & Carnrick booth. Literature and samples are available.

**J. B. ROERIG AND COMPANY**  
Booth 217

Attending physicians are cordially invited to attend the exhibit of J. B. Roerig and Co. Members of the Professional Service Department will be on hand to explain in detail the several products which will be displayed. Two new products will be featured: Lactnz, a new protein hydrolysate, and Obtron, the new dicalcium phosphate, iron, and vitamin capsule, will have appeal for many physicians. Company representatives will welcome all inquirers and will be pleased to extend the courtesy of the Professional Service Department to all visitors.

**SANBORN COMPANY**  
Booth 124

Visit Booth No. 124 and see the direct-writing VISO-CARDIETTE which, with amazingly simple operation, provides a finished and permanent cardiogram on the instant of the heart impulse—the photographic INSTOMATIC CARDIETTE, long famous for its simplicity and light-weight portability—the ELECTROKYMOGRAPH which transmits the motions of the roentgenoscopic cardiac silhouette border to an electrocardiograph for recording on photographic paper. Also, those interested in the very latest in metabolism testing should not miss seeing the many new advantages of the METABULATOR.

**SANDOZ CHEMICAL WORKS, INC.**  
Booths 174-175

Recently released—the new anti-epileptic drug—MESANTOIN (methyl-phenyl-ethyl-hydantoin), for the control or reduction in the frequency of epileptic seizures. Other new products are Dihydroergotamine. "Sandoz" (D. H. E. 45), the new improved non-narcotic relief for migraine; Glysenid for constipation contains the crystalline glycosides from senna leaves, Sennosides A and B; also displayed are Cedilanid, stable preparation of Lanatoside C, a crystalline glycoside from Digitalis Lanata, not present in purpurea; Ipsandrine Syrup for the relief of cough and bronchial disorders—containing the active alkaloids of Dover's Powder in pure form with ephedrine.



**W. B. SAUNDERS COMPANY**

Booth 3

This Company will exhibit their complete line of books including Hyman's *Integrated Practice of Medicine*, Bockus' *Gastro-enterology*, Rubin's *Diseases of the Chest and X-Ray*, Cooke's *Allergy*, new editions of Wechsler's *Clinical Neurology*, Ranson & Clark's *Anatomy of the Nervous System*, Novak's *Gynecological and Obstetrical Pathology*, Cecil's *Medicine*, DeLee and Greenhill's *Obstetrics*, Wharton's *Gynecology and Female Urology*, Duncan's *Diseases of Metabolism*, Boyd's *Surgical Pathology*, McCombs' *Internal Medicine*, *American Illustrated Medical Dictionary*, and many others.

**SCHERING CORPORATION**

Booths 46-47

The Schering booth will feature the potent oral estrogenic hormone, Estinyl (ethinyl estradiol), the oral progestin, Pronone (anhydrohydroxy-progesterone) and the oral androgen, Oreton-M (Methyltestosterone). The well-known parenteral hormones, Oreton (testosterone propionate), and Cortate (desoxycorticosterone acetate) will also be displayed. The new effective treatment for ophthalmic infections, Sodium Sulfacetamide Solution 30% will be of interest as will be the clinically safer sulfonamide combination Combisul-TD and the radiographic media Priodax and Neo-Iopax. Schering Professional Service representatives will be present to welcome physicians' inquiries.

**G. D. SEARLE & COMPANY**

Booths 190-191-192

You are cordially invited to visit the Searle booth where our representatives will be happy to answer any questions regarding Searle Products of Research. Featured will be Hydryllin, the new anti-histamine, as well as such time-proven products as Searle Aminophyllin in all dosage forms, Metamucil, Ketochol, Floraquin, Kiophyllin, Kiodoquin, Pavatrine and Pavatrine with Phenobarbital.

**SHAMPAINE COMPANY**

Booths 46-47

The Shampaine exhibit consists of various pieces of physicians and hospital furniture in which are incorporated the latest improvements in design and efficiency. Among other items shown will be the well-known Martin All-Purpose Chair-Table, the Steelux Line of physicians furniture, the Headend Controlled Perfection Operating Table. Factory representatives will be available for consultation.

**SHARP & DOHME, INC.**

Booths 65-66-67-68

Sharp & Dohme extends a cordial welcome to all visitors. Items on exhibit include a new dosage form of "Delvinal" Sodium Vinbarbital for the production of obstetric amnesia and analgesia; "Delcos" Granules—an exceptionally palatable protein nutritional agent; "Lyocyte" Dried Human Blood Cells—an aid in tissue regeneration in various lesions; "Lyo B-C"

Principal B-complex Factors and Ascorbic Acid for parenteral use; "Sulfasuxidine," and "Cremosuxidine"—intestinal bacteriostatic agents.

**SHERMAN LABORATORIES**

Booth 45

New-Diprotein, a palatable amino acid with vitamins and iron added, also, new developments in the management of gastrointestinal dysfunction with Acaro products, a powerful demulcent and soft, smooth bulk-former. New formulas for injectable vitamins.

**SIEBRANDT MANUFACTURING CO.**

Booth 232

The exhibit will feature a new type Portable Fracture table, moderately priced, which will serve for reduction and alignment of the various conditions required in fracture treatment. Siebrandt's Portable Fracture Table is built "knocked down" and most of the accessories are stored in the box-like case that represents the table top. It will serve the greater majority of conditions that require positioning, and will do it more simply in many ways. The Goodwin Bone Clamp—Clayton Transfixion Splints—and a complete line of fracture equipment will also be shown.

**J. SKLAR MANUFACTURING CO.**

Booth 43

The Sklar exhibit will feature a comprehensive display of stainless steel surgical instruments. Many of these are new instruments never displayed before at an IPMA Assembly and comprise a great number of specialized instruments developed and produced in cooperation with leading American Surgeons. On display also are exclusive models of suction and pressure apparatus including the ever popular Tompkins Rotary Compressor, the Ideal Unit and the Imperatori Apparatus. The Davidson Pneumothorax Apparatus will also be on view.

**SMITH-DORSEY COMPANY**

Booth 12

Estrogenic hormone, Liver and other parenteral products will be featured in the Dorsey exhibit. Dorsey representatives welcome you to the exhibit every day.

**SMITH, KLINE & FRENCH LABORATORIES**

Booths 59-60

Eskay's Oralator, featured at this exhibit, provides a revolutionary method of cough control. Inhaled by mouth, the Oralator's anesthetic-analgesic vapor (2-amino-6-methylheptane) is delivered directly to the nerve endings in the trachea and larynx, where it controls cough within a matter of seconds. Safe and effective, the Oralator is indicated in those types of coughs for which codeine would ordinarily be prescribed. The Oralator produces no appreciable systemic effects. Our specially trained professional representatives will be glad to answer questions concerning the possible uses of our products in your practice.

**SPENCER INCORPORATED**

Booth 11

This exhibit will feature Spencer Individually Designed Supports for abdomen, back and breasts. You

will especially want to examine the three-tab Spencer-flex, a new support for men designed for postoperative wear. The Spencer Breast Form as an aid in the treatment of patients who have undergone mastectomies will also be of particular interest. Other designs of Spencer Supports in the treatment of many conditions will also be on display.

**E. R. SQUIBB & SONS**  
Booths 75-76

Presenting a wide variety of newly released Squibb preparations for prescription use.

**FREDERICK STEARNS & CO.**  
Booth 81

You are cordially invited to visit the exhibit of Frederick Stearns & Co. Division. Parenamine and Essenaminate, Stearns parenteral and oral protein products, will be exhibited as well as Fergon, Stearns Ferrous Gluconate, and Neo-Synephrine Hydrochloride products for intranasal, parenteral and ophthalmic use. Our professional staff will be in attendance to discuss these products with you.

**R. J. STRASBURGH COMPANY**  
Booth 86

The R. J. Strasburgh Co. will feature the results of research and investigation in three fields: Cardiology, Gastro-enterology and Dermatology.

**SUTLIFF & CASE CO., INC.**  
Booths 89-90

Professional representatives will be on hand as usual to greet you and discuss with you a new important product. HYPER-RU combines the therapy of potassium thiocyanate in hypertension with that of rutin for capillary fragility. Also on display will be the original preparations of thiocyanates for the treatment of arterial hypertension, and other new pharmaceutical products.

**TAMPAX INCORPORATED**  
Booth 171

If you have not yet familiarized yourself with TAMPAX, the preferred 3-absorbency, intravaginal menstrual tampon, you will wish to visit the TAMPAX exhibit featuring the Dickinson anatomical models where educational consultants are in attendance. If you are already acquainted with TAMPAX's many advantages, be sure to register for the latest literature or educational material and samples of our product.

**THE TECHNICON COMPANY**  
Booths 164-165

The Technicon Co. will exhibit the new direct writing "Technicon Cardiograph" as well as the "Autotechnicon" and "Scopicon." This Cardiograph scribes three leads simultaneously on all patients. There is built-in provision for taking the three standard leads, three augmented extremity, uni-polar leads, three pre-caudal leads, all recorded simultaneously directly on the "Triagram" chart. All equipment will be in actual operation throughout the meetings.

**U. S. VITAMIN CORPORATION**  
Booth 32

Full color illustrated brochure "Diagnosing Vitamin

Deficiencies" together with professional samples and literature on VI-SYNERAL POLY-B, VI-LITRON, HYPERVITAM, LIPO-HEPLEX, DALSOL, DESIVER, AMIPROTE, RUTIN, METHISCHOL and others.

**UNIVERSAL PRODUCTS CORP.**  
Booth 125

Of special interest in this exhibit is the Surgeon's "FINGALYTE," an excellent diagnostic set that penetrates and throws light on and into all tissues or crevices. It is of low wattage and cool for transillumination and its exceptional simplicity and ease of operation will save time for many surgeons and general practitioners. Other interesting features of this equipment are a headlight that weighs only two ounces and instruments in constant vapor sterilizer bath.

**UNIVERSITY OF CHICAGO PRESS**  
Booth 238

The exhibiting of BOOKS FROM UNIVERSITY PRESSES is an outgrowth of the Association of American University Presses. Each press represented is a separate publishing company devoted to the production of important technical and scholarly works which might otherwise go unpublished, as well as general books of vital interest to all.

**UJOHN COMPANY**  
Booths 17-18-19

The first panel of the display outlines diagrammatically the mechanism of blood clotting. Next to that is a panel dealing with the use of thrombin as a sort of biologic cement for attaching skin grafts. The center panel describes the use of Gelfoam (a tissue absorbable sponge) moistened with thrombin as a hemostatic agent. Then the absorption of Gelfoam in the tissue is demonstrated by a series of histologic specimens on the fourth panel. The final panel depicts the clinical use of the natural anticoagulant, heparin.

**WALGREEN COMPANY**  
Booths 1-2

Included in the Walgreen exhibit are Antibiotics, Amino Acids, Hormones, Vitamins, Anti-histamine and Anti-Anemic preparations. While these products may be seen in other booths at the exhibit separately, only at the Walgreen booth can they be seen in therapeutic groupings. Descriptive literature is available for all physicians.

**WALLACE & TIEMAN PRODUCTS**  
Booth 154

You are cordially invited to visit our exhibit. We will welcome the opportunity to discuss our products. W & T is exhibiting AZOCHLORAMID, a stable and highly bactericidal chloramine for wound dressings and irrigations; MONOMESTROL, a synthetic estrogen, orally effective and well tolerated by the patient; DESENEX, a potent, yet non-irritating fungicide; and SOTRADECOL, a new synthetic sclerosing agent.

**WILLIAM R. WARNER & CO., INC.**

Booths 208-209

William R. Warner & Co., Inc., will introduce Heparin Pitkin Menstruum "Warner," a unique heparin preparation which affords prolonged anticoagulant action without the need for frequent injections. All the benefits of heparin are provided with greater economy and less discomfort. The Warner representatives will gladly supply current information on this important medical contribution.

**WESTWOOD PHARMACAL CORP.**

Booth 162

Representatives at the Westwood Booth will demonstrate the ease of application inherent in the improved Westhiazole Vaginal single-dose applicators. This new method of treatment stresses convenience and simplicity in vaginal anti-infective medication with Westhiazole jelly which, because of its wide applicability, makes unnecessary previous identification of the causative organisms.

**WHITE LABORATORIES, INC.**

Booths 79-80

White's Dienestrol Tablets—a new orally effective synthetic estrogen is featured. Complete information and literature are available regarding the advantages of Dienestrol's high biologic activity, excellent patient-tolerance and economy. Other products of White Laboratories are on display and White's Medical Service representatives in attendance will be pleased to supply any further information requested.

**WILCO LABORATORIES**

Booth 237

New therapeutic products will be exhibited by Wilco Laboratories. These include: Neo-Enzymes, digestive enzyme complex active on carbohydrates, proteins, and fats, in both plain and laxative types; Edrex, vitamin management in arthritis and the arthritis-fibrositis syndrome; Uran, self-acidifying urinary antiseptic in tablet form; Enzybex, high potency vitamin B-complex with enzymes; and Hemobex, iron with vitamin B-complex.

**WILLIAMS AND WILKINS CO.**

Booth 229

The Williams and Wilkins Co. will feature the latest editions of such best sellers as Albrect's *Modern Management in Clinical Medicine*, Grant's *Atlas of Anatomy*, and Best & Taylor's *Physiological Basis for Medical Practice*. In addition, a number of new titles will be available as well as the firm's complete line of medical periodicals including the new medical abstract service, *Excerpta Medica*.

**WINTHROP CHEMICAL CO., INC.**

Booth 87-88

Winthrop's display consists of colored models by Dr. Justus F. Mueller showing the causative agents of the various forms of malaria. The complete malarial cycle is reproduced, including the recently discovered exoerythrocytic (tissue) phase of the cycle. Also featured will be the latest therapeutic contributions made by this firm, including Demerol, powerful analgesic,

spasmolytic and sedative; Aralen, new colorless anti-malarial specific; Diodrast 70%, the only contrast medium for cardiography and Neocurtasal, sodium-free seasoning agent.

**MAX WOCHER & SON COMPANY**

Booths 197-198-199-200

By virtue of its great manufacturing facilities for both furniture and instruments, the Max Wocher & Son Co. can be depended upon to exhibit many models that heretofore have been missing from the convention displays. The Max Wocher & Son Co. will show a big, new line of examining and operating equipment and many new instruments that were originated by this concern and have since attained great popularity. The Wocher display will be considerably larger than in the past and is sure to prove of tremendous interest to all classes of physicians.

**WYETH INCORPORATED**

Booths 4-5

Wyeth, Inc., Philadelphia, will exhibit four of its leading specialties. The products are Sopronol, a propionate-caprylate compound for fungus infections of the skin; Meonine, di-Methionine Wyeth, for the prevention and treatment of liver damage; Purodigin, pure digitoxin for congestive heart failure; and Wyeth Penicillin Calcium in Oil and Wax, Romansky Formula, now in fluid form. Wyeth representatives will be on hand with samples and literature.

**YEAR BOOK PUBLISHERS, INC.**

Booth 38

Potter's *RH*, Sulzberger & Baer's *Office Immunology*, Hodges, Lampe & Holt's *Radiology for Medical Students*, Caffey's *Pediatric Diagnosis*, Schiff's *Jaundice*, and many new editions of general-practice manuals and monographs and the 1947 YEAR BOOKS—these highlight the many timely, practical clinics—in print which every physician is cordially invited to peruse in Booth No. 38.

**F. E. YOUNG & CO.**

Booth 158

F. E. Young & Co. will exhibit Young's Rectal Dilators—supplied in sets of 4 graduated sizes and used in series as the anal sphincter becomes accustomed to dilation. Helpful in the treatment of constipation, dysmenorrhea, hemorrhoids and other conditions associated with the treatment of spastic anal sphincters. Doctors also use them postoperatively to avoid rectal discomfort.

**ZIMMER MANUFACTURING COMPANY**

Booth 149

The Zimmer Manufacturing Co. will exhibit a very complete line of splints and all types of fracture equipment. A number of new and improved bone instruments will be on display, among which will be the Moreira Stud-Bolt Set, Rizzo Retractors, Orthopedic Hammer, Blount Driver-Extractor, Martin Hip Gouge, Intramedullary Fixation Instruments, Eggers Contact Splints, Hollow Mill, Improved Bone Clamp Sets, Lewin Walking Heel and Vinke Skull Tractor.

# After Hours

## MICHIGAN DOCTORS LIKE THEIR FISH

If a poll were taken of Michigan physicians it would probably show that their favorite after-hours' recreational activities are trout fishing, gardening, hunting, boating, flying and other outdoor pastimes, in just about that order. Or perhaps the ratings have been somewhat influenced by the slightly more colorful tales told by the rod-and-reel men.



"There are no slack seasons in fishing in Michigan," says Dr. R. S. Van Bree, surgeon: "There may be dull days but no slack season."

Dr. Van Bree, a resident of Grand Rapids, (meeting place of the 1947 State Medical Convention) enjoys a "long season," for he usually starts early in the year with ice fishing. He reports that Lake Michigan perch, caught in about 18 feet of water at White Lake, Muskegon Lake or Macatawa, make a tasty meal for a winter day. Bear Lake, just north of Muskegon, is probably the most famous in that locality for fishing bluegills through the ice and is well stocked in the early part of the season.



For pike or pickerel fishing, the lakes around Grattan or the Muskegon River above Hardy Dam are good. A complete ice fishing season should include the overnight trip to Beulah to fish for smelt in Crystal Lake. Here, the fisherman can drive his car onto the ice to one of the many large shanties equipped with stove, cots, and cooking utensils.

After the ice breaks up, usually during the first week of March, the large northern pike, ranging from 18 to 60 pounds, are running in the Kalamazoo River and may be found just below the dam at Allegan.

About the first of April, fishermen start trying for walleyed pike, suckers and catfish on the Muskegon and Grand Rivers. The trout season usually starts the last Saturday in April with every Walton Leaguer ready at his favorite stream. This year, Dr. Van Bree reduced the trout population of the Jordon and the Big Manistee Rivers, as well as some of the little streams running into nearby lakes.

Around the first week in May, perch start running at the piers in Holland, Grand Haven and Muskegon, with the "hig ones"

at Charlevoix and Ironton. The season for bass and bluegills on the inland lakes usually opens on June 25 and, according to Dr. Van Bree, the best spot in years has been White Lake at Whitehall. Favored places for lake trout are Northport, on the arm of the Grand Traverse Bay, and Grand Marais in the Upper Peninsula.

A trout fisherman who started when he was 8 years old and hopes to keep it up until he's 80 is Dr. Leon E. Sevey, also of Grand Rapids. Dr. Sevey, a surgeon, believes his hobby affords complete mental relaxation along with physical exercise in the outdoors.



Dr. Sevey spends many week ends and usually a ten-day vacation at his log cabin on the bank of the Little Manistee River, which is but a two-hour drive from his home. The section of the river above and below Dr. Sevey's cabin is ideal for the dry fly fisherman and the catch is usually brown and rainbow trout. "My cabin," says Dr. Sevey, "is paradise."



Another Grand Rapids outdoor enthusiast is Dr. Ruth Herrick, dermatologist, who enjoys photographing scenes which are particularly typical of Michigan, such as the old stump fences and covered bridges. Dr. Herrick became interested in her hobby many years ago when her father, Dr. C. Judson Herrick, Professor of Neurology at the University of Chicago, (retired) gave her a No. 2 Brownie camera.

Hunting and fishing have been the hobbies of Dr. Louis H. Chamberlin, who is retiring this year at the age of 73. Dr. Chamberlin has practiced medicine in Grand Rapids for fifty years, specializing in surgery the last thirty-six years. His advice to young doctors is to get away from their work and do something far removed from it. "A doctor sees the seamy side of life continually," says Dr. Chamberlin, "hears nothing but trouble, disease and pain. The only remedy is to get

away from it all, even if it is only a day off a week. It is a great mistake for young doctors to say they intend to play when they retire—for they will not have learned to play."

While Dr. Chamberlin is not exclusively a fly fisherman, he feels it is really the sporting way to fish. Equally stimulating to him is the hunting of partridge, woodcock and pheasant, but he feels that watching a dog range, point and retrieve is as interesting as killing the birds. He hunts deer and bear only with a camera and believes a doctor should have one camping-out trip a year. He also adds that while doctors' wives should bid their husbands "God speed" with a smile when they leave for a few days of fishing and hunting, "Blessed is he who has a wife who also likes to hunt and fish."

Another doctor who gets as much pleasure out of the training and association of bird dogs

as he does in the sport of bird hunting itself is Dr. Ferris Smith, surgeon. For many years he has owned and trained one or more fine setter dogs—either English or Irish. Dr. Smith also likes to sail in a Wee Scot at his summer home on Elk Lake and does considerable fishing there. During his leisure hours in town Dr. Smith enjoys working in the fine machine shop which he has in his home. He particularly likes to make fine, small furniture pieces.

Other Grand Rapids hobbyists, keenly interested in hunting and fishing are: Dr. R. H. Sidell, Dr. Lee O. Grant, Dr. Joseph De Pree, Dr. Isla De Pree, Dr. Milner S. Ballard, Dr. Gordon W. Balyeat and Dr. W. D. Lyman.

#### JACKSON

There are several doctors in Jackson who list hunting and fishing as their hobbies. One of these, Dr. Walter Finton, is a specialist in big game hunting and has written a book, "The Alaskan Bear," on his experiences in Alaska. Another, Dr. R. H. Alter, has done a good deal of Michigan and Canadian trout fishing and Moose hunting.

Dr. Alter, whose wife is also enthusiastic about the sport, enjoys trout fishing in Michigan's lower peninsula and in Canada in the district about 100 miles north of the Soo. In this area the trout are commonly known as speckled or square tails and are of a larger size than brook trout. These Canadian trout can be taken from the lakes about the tenth of May, when the ice first goes out, by trolling with spinners, worms or wet flies. Here, a few weeks later either wet or dry flies are used, according to Dr. Alter, a fly enthusiast.

Dr. Alter also likes to hunt

# The Diagnosis and Treatment of Epilepsy

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THERE are probably 600,000 people in the United States and Canada who suffer from epilepsy. It is as common as tuberculosis or diabetes. It may be even more disabling since the people and their relatives live in fear of fleeting seizures which may occupy but a few minutes out of years of promising life. It has been estimated that the direct annual cost of epilepsy must exceed \$100,000,000, but no one can estimate the cost in terms of grief and despair.

Epilepsy is a symptom and is due to periodic and explosive discharge of nerve cells in the brain. Each one of us is a possible candidate for an epileptic seizure under certain circumstances. Temporary arrest of blood supply to the brain, hypoglycemia, an electric shock, or other factors may induce a seizure in any normal person. In a sense the epileptic seizure is the brain's normal response to certain abnormal circumstances. The trouble is that in many cases we do not know what these circumstances are. In the end such neuronal explosions must be due either to metabolic or physicochemical

changes in nerve cells which render them unstable and permit them to fire off either spontaneously or when disturbed by a scar, a tumor, or other abnormality of the brain.

Why seizures due to hypoglycemia, brain tumor, or other demonstrable cause should be considered more reputable than those of unknown origin is hard to understand. But this feeling persists, and perhaps it can be laid to our own muddled ideas about heredity, mental deterioration, and personality changes in epilepsy. We are still left with the wastebasket term "idiopathic" epilepsy, into which we throw cases of unknown causation. Our main clinical problems are (1) to recognize and treat those cases in which seizures are due to disease of the brain, or to abnormalities of the circulation or of the chemical processes of the body, and (2) to treat symptomatically the cases which, in our ignorance, we label "idiopathic" epilepsy.

## INVESTIGATION OF A CASE OF EPILEPSY

Many of the steps taken to discover organic causes of seizures are well known. I shall review them briefly, emphasizing certain new and valuable methods. The search must be patient and systematic to be successful.

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*Clinical investigation*—The age of onset and type of seizure are of fundamental importance. Omitting the convulsions which occur so frequently in childhood, and which are associated with any fever, we may say generally that epilepsy starting within the first two decades usually is to be placed in that vague group called idiopathic. Starting within the next two decades it is usually associated with brain tumor. Thereafter renal and cerebral vascular causes become increasingly frequent, but the possibility of brain tumor should always be kept in mind. A history of prolonged or difficult birth and retarded development may indicate cerebral birth trauma. Head injury, even if remote, should suggest the possibility of a meningocerebral scar as a cause of seizures.

Every physician, nurse, and relative should be taught to describe accurately the patient's aura and the pattern of attacks. The common patterns of focal attacks are illustrated in Figure 1. A complete record giving the number and dates of seizures must be kept by the patient, since this is the only true guide to the success of therapy. It is essential to observe the very beginning of an attack since it may spread rapidly from a focal to a generalized convulsion without a localizing pattern. Rapid examination immediately after an attack may reveal temporary changes in the reflexes or sensibility which point to a focal defect and which cannot be elicited in the interim.

It is occasionally necessary to induce an attack in order that the pattern can be observed. This can sometimes be accomplished by having the patient hyperventilate strongly until an attack occurs or until carpopedal spasm appears. Hydration of the patient is even more effective. Water is given in large quantities along with repeated injections of pitressin. This is, however, a hospital procedure.

Appropriate chemical studies are based on the circumstances under which attacks occur. Spontaneous hypoglycemia may be suspected if attacks occur during fasting and are preceded by vagueness, anxiety, and sweating. There may be a curious, dreamy state with purposeless behavior both before and for a long time after



DONALD S. McEACHERN

the seizure. Attempts should be made to produce attacks by fasting, to relieve them by administration of glucose, and to obtain chemical proof by blood sugar determinations made during attacks. Glucose tolerance curves should be carried at least to five hours in order to determine the low point which follows the early rise of blood sugar. A word of caution—sugar curves are tricky things to interpret.

I recall two elderly patients in whom epileptic seizures occurred only during the development of recurrent latent tetany. One suffered from osteomalacia and the other from mild parathyroid deficiency resulting from a thyroid operation. Attacks associated with uremia, cerebral syphilis, vascular hypertension, and cerebral arteriosclerosis are usually recognized by careful routine examination. Even in these instances, however, special studies may be necessary, since there is no guarantee that cerebral tumor and arteriosclerosis or syphilis do not coexist. We have seen the conjunction on several occasions.

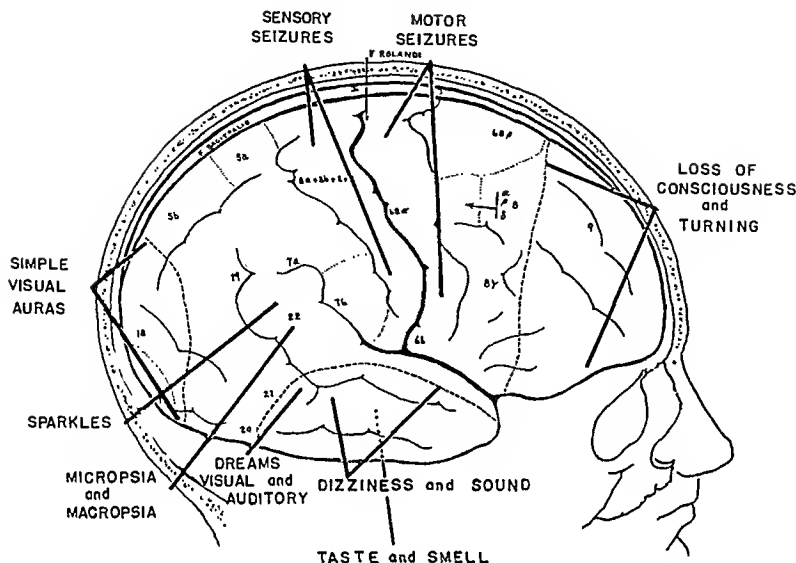


Figure 1. Chart of common initial phenomena of seizures arising in different parts of the brain. The leading lines indicate general and not punctate localization.

MENTION should be made of seizure with hypersensitivity of the carotid sinus reflex mechanism. As a result of sudden turning of the neck, an unusual position of the head, or pressure from a high stiff collar, such patients suffer from a reflex fall of blood pressure or cardiac arrest, or both. Syncope results, and if the cerebral circulation is interrupted for more than about twelve seconds, a convulsion may ensue. One of my patients, a middle-aged man, complained of seizures since childhood. Attacks first came when he knelt to pray in church on Sunday. This was the only day of the week when he was dressed in an Eton suit with a high, stiff collar. Attacks ceased when the minister advised that he stay away from church since the prayers obviously did him no

good. Attacks recurred later when he sat in the barber's chair and his head was thrust forward while the nape of the neck was clipped. It was easy to reproduce the attacks by pressure over either carotid sinus.

Carotid sinus syncope should be suspected in any elderly patient who complains of brief spells of fainting, dizziness, or "black-out." It can be tested by massaging one carotid sinus at a time with the thumb placed behind the angle of the jaw. The patient should be in an upright position.

Explanation of the mechanism may suffice to keep these people out of trouble. Atropine or ephedrine is occasionally helpful. If necessary, the sinus can be denervated surgically. Attacks of similar character occur with Stokes-Adams syndrome in heart block.





Figure 2. Pneumoencephalogram of patient with cyst of right temporal lobe and generalized seizures.

*Roentgenography*—Good stereoscopic x-ray films of the skull should never be omitted. They may show quite unsuspected bony changes or asymmetry of the skull. There may be calcium deposits indicative of tumor, shift of the shadow of the pineal gland due to an atrophic or expanding lesion in one hemisphere, or even evidence of increased intracranial pressure.

*Pneumography*—X-ray visualization of the ventricles following injection of air or oxygen into the subarachnoid space has proved an invaluable procedure. When there is no contraindication, encephalography is done, the gas being injected by the lumbar route after removal of spinal fluid. A case in point is that of an 8-year-old girl, who was presumed to have been suffering from idiopathic epilepsy for four years. X-rays of the skull showed marked disproportion between the two sides of the cranial cavity; the encephalogram (Figure 2) revealed

lack of filling of the right temporal horn and displacement of the ventricles to the left. At operation a large cystic collection of cerebrospinal fluid was found in the right temporal lobe due to a thin membrane which separated the temporal horn from the rest of the ventricular system. This thin veil of tissue, presumably a congenital defect, spelled the difference between normal health and epilepsy.

A more recent case is that of a man of 46, whose only complaints were two generalized convulsions commencing several months previously. Clinical examination was negative. The encephalogram (Figure 3) showed the right lateral ventricle to be depressed downward and displaced to the left. This was due to a large meningeal tumor, which was removed.

Meningocerebral scars, subdural hematomas, and areas of focal atrophy may also be recognized by this method and dealt with surgically.



Figure 3. Pneumoencephalogram with generalized seizures due to benign meningeal tumor in right parietal region.

*Cerebral arteriography*—The visualization of the cerebral arteries following injection of a radiopaque substance, such as thorotrast, into the carotid artery in the neck is of limited usefulness. When an aneurysm or vascular tumor is present, however, it may be the best or the only way to visualize the lesion.

*Electroencephalography*—Although a newcomer in the field, this method has already become well established. During its few years of rapid growth, this ingenious method of recording the so-called "brain waves" has become a reliable clinical tool.

The principle is that the rhythmic changes of potential of the normal brain can be led off from the surface of the intact scalp, stepped up about one million times by radio amplifiers, and recorded by means of ink writers on a moving strip of paper. Small silver electrodes are fixed to the scalp with collodion in a num-

ber of standard locations on each side of the head. (See Figure 4). These are led off to a switching box which permits simultaneous records to be made from a number of locations. The electrical activity of one side of the brain may be compared with that of the other side, or one small area with another.

Normally, two main rhythms can be recorded from the adult brain. Alpha (Berger) waves appear from the occipital regions at a frequency of about 10 per second, and beta waves at about 22 per second from the frontal regions. In epilepsy the normal rhythms are greatly disrupted, not only during a seizure but (also nearly always) during intervals when the patient seems entirely well. (Figure 5).

THE following are some applications of this method to our knowledge of epilepsy. The diagnosis of an epileptic attack is easy



Figure 4. Method of applying scalp electrodes for electroencephalography.

when a seizure is observed or has been accurately described. When, however, there is but a vague history of fainting spells, of waking in the morning with a bitten tongue, or of momentary absences, the diagnosis of epilepsy is a precarious one. The electroencephalogram may assist by showing either typical epileptic abnormality or a normal rhythm. Further, temper outbursts and fleeting personality changes in an epileptic patient can sometimes be correlated with a surge of subclinical electrical abnormality in the brain, though there may be no outward sign of a convulsive seizure. Indeed, many problem children have been found to have such electrical abnormalities even though they had never suffered convulsive seizures.

The electroencephalogram also gives some indication of the type of epileptic activity. It is possible that with further experience we will

classify seizures according to the underlying electrical abnormality, just as the terminology of the cardiac arrhythmias was altered by MacKenzie's study of pulse tracings and Lewis' analysis of the electrocardiogram.

Occasionally, differentiation between hysteric and epileptic seizures may be aided. Records taken during an hysteric seizure show a normal cerebral rhythm. Epileptics always show seizure waves during an attack.

*Localization* of epileptic foci is another important function of electroencephalography and may lead to successful surgical removal of the focus.

Finally, the method may be of value in the *control of medicinal therapy*. If a patient has a seizure only once in several months, it may take painfully long to determine whether his medication is adequate. His electroencephalogram may, however, show almost continual

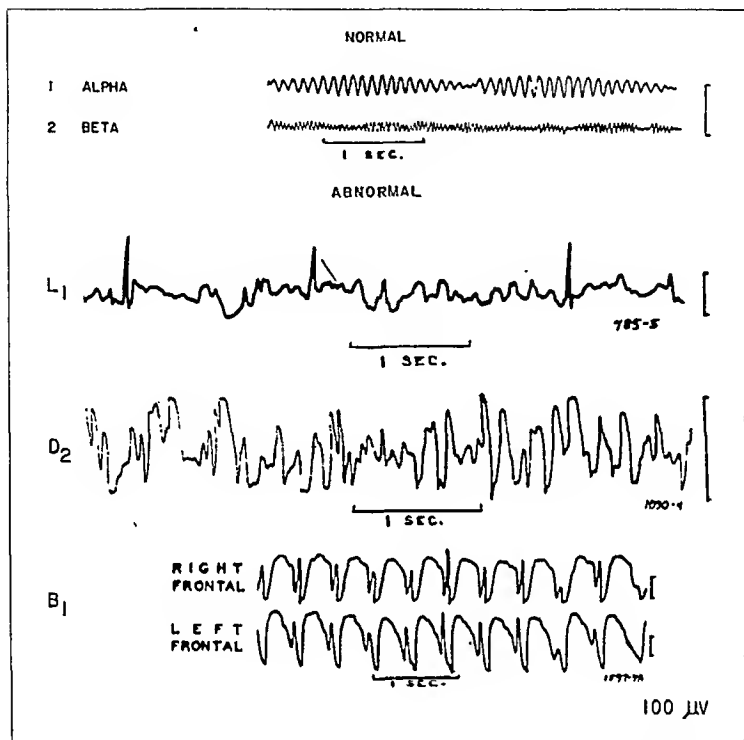


Figure 5. Samples of normal and abnormal encephalograms.  $L_1$ —Local random spikes from patient with focal epilepsy due to meningo-cerebral scar.  $D_2$ —Diffuse multiple sharp waves from patient with idiopathic epilepsy.  $B_1$ —Bilaterally synchronous spike and slow waves from patient during petit mal attack.

epileptic activity which is reduced or disappears within a few days with adequate therapy. Unfortunately, there is no rule to this, and some patients may remain free of attacks with little or no improvement in the electroencephalogram.

Let us guard against the exploitation of this valuable method. The technic is difficult to master, and interpretation of the records re-

quires experience and good judgment. Remember the early days of electrocardiography, when machines were multiplying by the hundred and self-styled heart specialists sprang up overnight. It will not be long before fairly simple apparatus is available for recording the E.E.G. Let us use it with caution and common sense and not as "gadgets."

We have reviewed the steps sometimes neces-

sary to uncover the causes of epileptic seizures; there remain, however, many cases for which no cause can be found. It is worth while, then, to discuss the medicinal treatment of such cases.

#### TREATMENT

*Drug therapy*—We will consider here only drugs of proved usefulness—the bromides, phenobarbital, dilantin, mebaral, and the new drug, Tridione. They are powerful tools and it is worth remembering certain principles governing their use. First, some patients are not helped by medicines. If seizures are not reduced or the patient is not benefited, it is wasteful and may be harmful to continue with the drug. Second, there is no standard dose that suits all patients. The dose should be increased until seizures are controlled unless toxic symptoms prevent this. Third, not all types of seizures are helped equally by a given medicine. It is criminal to permit a patient to go on for months or years with uncontrolled seizures and try no change of medication. Fourth, our aim is not only to stop seizures, but to improve the total condition of the patient. A regimen which stops seizures but turns the patient into a vegetable has little to recommend it. With these points in mind, let us now take inventory of our tools.

THE bromides are used much less now than formerly. They are often not as effective as the other drugs. They frequently cause unpleasant acne, depress and slow down the patient's mental activity, and occasionally pile up in the system to cause a real toxic psychosis. The latter picture is not as well known as it should be, though it is not uncommon. The patient develops incoordination, a staggering gait, and thick speech. This may advance to frank delirium with hyperactivity delusions, hallucinations, and even coma. One of our patients who was treating himself with a mail-order epilepsy nostrum was committed to a mental institution before the condition was recognized. The psychosis is related to the concentration of bromide in the blood and tissues, and the well-

known bromide skin eruption is usually absent. The condition can go unrecognized for months. The blood bromide is almost invariably above 150 mg. per cent. Treatment consists of replacing the bromides by some other drug, and of giving 12 to 15 gm. of sodium chloride per day. The chloride replaces the bromide ion, and the psychosis clears quite rapidly. Despite these disadvantages there are some cases of epilepsy in which the bromides give better control of seizures than any of the other drugs.

Phenobarbital is probably a more effective drug and certainly causes fewer toxic manifestations. Moderate doses may not cause dullness; large doses, however, may be necessary to control seizures, and then unfortunate slowing of cerebration results. A good tip is that the addition of small doses of benzedrine or of caffeine may abolish the mental dullness without altering the anticonvulsive effect of the phenobarbital. A total of 1.5 to 2 gr. of phenobarbital per day, divided into several doses, may suffice to control seizures, but we have sometimes been forced to raise the dose to 9 gr. daily, before the seizures were controlled or the drug was abandoned. Phenobarbital is also available in soluble form for use in prescriptions. This sodium salt contains 10 per cent less phenobarbital than the phenobarbital itself. Liquid preparations should not be kept for more than three weeks, since absorbed  $\text{CO}_2$  tends to precipitate the acid form of the drug.

Phenobarbital soluble is valuable when given intravenously or subcutaneously in doses of 1 to 5 gr. for the control of status epilepticus. In this emergency, however, we prefer to use avertin administered by rectum in two-thirds the usual anesthetic dose.

Dilantin (sodium 5, 5-diphenylhydantoinate), a new drug, has already proved its merit and has practically remade the lives of some epileptic patients. It has high anticonvulsive power; its great advantages are that it has no hypnotic effects and it causes no mental dulling. Occasionally, it has mild stimulating effects. I have seen patients who were apathetic, querulous, and inclined to temper outbursts transformed into pleasant, agreeable, and

brighter people when sedative drugs were replaced by dilantin.

In a large series of cases dilantin has proved more effective in stopping or lessening seizures than either phenobarbital or bromides. It is especially effective in controlling psychomotor seizures, the so-called psychic variants, or states of motor automatism, which are little influenced by the bromides or phenobarbital. Like other drugs, dilantin is much less effective in controlling petit mal attacks. It may indeed aggravate them. In the end, a persistent and conscientious search is necessary to determine which drug is the best for the individual patient. I have one patient whose seizures have been completely abolished by the use of dilantin, whereas a cousin's attacks which became worse with dilantin are well controlled with phenobarbital.

Dilantin is analogous to the barbiturates, but is a derivative of glycolyl urea instead of malonyl urea. It is soluble only in alkaline solution and therefore cannot be given intravenously. The drug is available in capsules containing 1.5 gr. for adults and 0.5 gr. for children. The usual dosage for adults is 1.5 gr. three or four times daily, though we have exceeded that amount on occasion. The drug should be taken during the course of a meal or with milk before retiring to avoid any tendency to gastric distress. The dosage is proportionately less for children, and the powder may be mixed with cream if they are unable to swallow capsules. If adequate doses of dilantin fail to control attacks, the addition of small doses of phenobarbital sometimes meets with success. The most suitable combination is a matter for clinical trial.

CERTAIN mild toxic phenomena are quite common with dilantin. After a few days of full dosage there may appear some degree of nystagmus, diplopia or difficulty in focusing the eyes, and moderate dilatation of the pupils. There may be dizziness, incoordination of the limbs, and staggering gait. These symptoms usually pass off in a few days. If not, it may

be necessary to reduce the dose for a week. Resumption of the full dose may then not lead to a return of toxic symptoms. Only rarely is it necessary to discontinue the drug.

Quite exceptionally a patient appears to be sensitive to dilantin and reacts with sharp fever, sore throat, or a skin rash. The latter is a red, macular eruption, involving the trunk and limbs and may be intensely itchy. It may appear within a day or so after treatment has begun, or as long afterwards as three weeks.

A much commoner but not very troublesome complication is a curious hyperplasia of the gums, occasionally accompanied by soreness and some bleeding. With good oral hygiene the condition has not forced us to stop using the drug in any of my cases. A very helpful point is to have the patient massage the gums with the forefinger for five minutes twice daily.

Toxic side effects are less apt to appear if the dosage of the drug is increased gradually over the course of several weeks to the desired maintenance level. If one wishes to change a patient over from phenobarbital to dilantin, the replacement should be made gradually.

A satisfactory method is as follows: If a patient is receiving phenobarbital three times daily, only one of these doses should at first be replaced by a dose of dilantin. After three days further replacement of one dose can be made, and so on every three days until the patient is receiving dilantin alone three or four times daily. This method reduces the danger of releasing seizures through sudden withdrawal of the phenobarbital.

The use of dilantin requires careful supervision by a physician and intelligent manipulation of dosage. It will then be found to work like a miracle for some patients, to benefit quite a number of others, and in a few instances to be useless.

Mebal (methylethylphenylbarbituric acid) is a drug with which I have not had wide experience. Reports indicate that it may be very satisfactory in some cases which are not controlled by other drugs. It is relatively free of toxic and hypnotic qualities and deserves wider

trial. The usual dosage is 3 gr., two or three times daily.

Tridione seems to have a special place in the treatment of petit mal attacks and other variants that are associated with 3 per second spike and slow waves in the E.E.G. (Figure 5). It is not effective against grand mal seizures but can be used along with one of the other drugs. Tridione has no hypnotic effects but may cause a curious visual phenomenon—a sensitiveness to bright light and loss of visual contrast. Some adults find this enough of a handicap to require withdrawal of the drug. Agranulocytosis due to Tridione has been reported, but with proper care and follow-up of patients we have had no trouble in this regard. The adult dose is one 5 gr. capsule three or more times daily.

**S**UCCESS with any of the above named drugs requires painstaking trial and adjustment of dosage. Too often the physician looks upon the situation with gloomy pessimism, writes a prescription for some drug, and washes his hands of the matter. There can be no excuse for the doctor who permits a patient to go on indefinitely with uncontrolled seizures without complete study of the case or change of regimen. It is important also to individualize treatment. Some patients have their attacks only at night, and should thus receive a larger proportion of their medication before retiring. Some women have attacks only at the time of the menstrual period, and should obviously be given greater protection at that time.

The doctor seldom witnesses a seizure save by accident. His chief concern is to save his patient from injury and embarrassment. The

collar should be opened, the limbs kept free of near-by objects, a folded handkerchief placed between the teeth if possible. Don't thrust a stick between the teeth. A bitten tongue will heal but not a broken tooth. During the brief period of purposeless behavior before recovery, go along with the patient and don't restrain him unless necessary. Above all, don't order an ambulance and admit him to hospital until you find out whether he wants you to.

The above discussion has dealt with but a few of the many questions that arise in the care of the epileptic patient. Others include the use of ketogenic diets in children; the question of rest and exercise and proper elimination; the avoidance of dangerous occupations; the problem of marriage, of bolstering the patient's morale, of tempering the family's shame and humiliation, of advising upon inheritance of a condition which may be many different conditions aping one another.

Idiopathic epilepsy should be a hopeful condition. It can be diagnosed early before there is mental deterioration; there is no structural impairment of the brain as in many other diseases. Education and understanding will remove the stigma from it as they have from cancer and tuberculosis.

Above all, we need funds. Funds to carry out large-scale trials of new drugs. Funds to support eager young men whose training fits them to delve into the mechanism of seizures. Funds to provide these men with the equipment they need. For this much is certain—be it a long time or be it short, investigation and research will some day reveal the mechanism that permits such seizures to occur.

# Disabilities Resulting from Compression Fractures of the Spine

ARTHUR STEINDLER\*

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IT is common belief among surgeons that in simple compression and comminution fractures of the spine without cord damage the solution of the problem of disability rests with the reduction and consolidation of the fracture. This opinion has been gaining ground rapidly with the introduction of the hyperextension treatment. It actually goes back to Taylor, who, in 1900, corrected his cases in supine position, hoisting the spine up by means of his "kyphotone," which was placed at the site of the fracture. Having been practiced by Pierre Mallet in France and Boehler in Germany, the method has found its most outstanding advocates in Watson-Jones in England, in Davis and Dunlap in this country, and in Bado in Uruguay, each of whom added their own modifications to the technic. The superiority of this newer hyperextension method need not be emphasized. Indeed, in recent fractures of the dorsolumbar or lumbar region, this method should always make possible the correction of the wedging of simple compression fractures.

O'Donahue, remarking that of all fractures of the spine, including lamina, spinous, and

articular processes, etc., only 19 per cent are pure compression fracture without cord damage, found that in 50 cases not treated by hyperextension methods the average true disability was eleven months and that 28 per cent of the cases were found to have persistence of symptoms with permanent disabilities extending for two years or more; he found that, on the other hand, in 28 cases treated by hyperextension the average disability was only five and one-half months. Watson-Jones states that in fractures of the dorsolumbar spine both compression and comminution type, treated by hyperextension methods, 80 per cent will resume their pre-accidental work and the average incapacity will be ten months for heavy workers and seven months for light workers.

Bado applies the hyperextension treatment in supine position and in two steps under head traction followed by cast. According to him, the average disability in lumbar compression fractures is five to eight months with a maximum of eight to ten months; in dorsal compression fractures treated in the same manner, it is four and one-half to five months; and in cervical fractures similarly treated but using the Crutchfield clamp it was six to ten months.

The principle of reduction by hyperextension is simple enough, but to evaluate the effect of

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such hyperextension we must not only make a distinction between several types of vertebral injuries which are commonly designated as compression fractures, but we must also consider injuries to other than the bony structures because they are important factors for the persistence of late complaints and protracted disability. Watson-Jones distinguishes between the pure compression and the comminution or crush fractures (From Watson-Jones, *Journal of Bone and Joint Surgery*, 1938, p. 567).

In simple compression fracture the disk above and below the wedge-shaped vertebra is intact; in the comminuted fracture it is often ruptured or destroyed. The great majority of patients with simple compression fractures treated by hyperextension methods recovered without permanent symptoms, whereas in those with comminuted fractures complete recovery is much less frequently the case. There are several reasons for this. For one thing, the disk is often thinned out, and the intervertebral articulation is contused or fractured, encroaching upon the foramina. This fracture is to be treated by the same hyperextension method as is the simple compression fracture, but it is



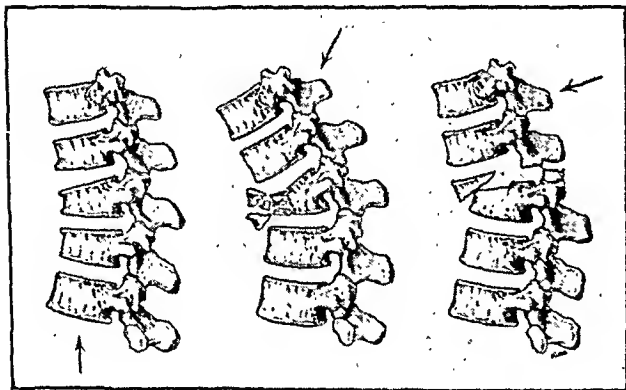
ARTHUR STEINDLER

slow in consolidating and it demands at least six months of immobilization. It is particularly in such cases that late and indirect sequelae, such as arthritis, intercostal neuralgias, etc., are observed.

#### SEQUELAE

It falls to the lot of the orthopedist to see cases of compression fractures, after a more or less extended time interval, for residual and persistent complaints which under ordinary expectations should have disappeared at this time. Thus, the total overall picture of the damage—skeletal, muscular, ligamentous—presents itself to him, calling for analysis of the pathomechanical background of the injury.

In the compression fracture the anterior portion of the vertebra gives way and is crushed by the vertebra above. So long as the intervertebral disk is intact, it functions as the fulcrum. When it is crushed, the articular facets spread apart and subluxate or even dislocate. As this



Courtesy, "The Journal of Bone and Joint Surgery."

Figure 1. The three varieties of flexion fracture of vertebral bodies: (left) simple wedge fracture due to vertical compression; (center) comminuted fracture due to acute flexion angulation; (right) fracture-dislocation due to flexion with traversing momentum.

occurs certain ligamentous structures become strained or torn; in sequence, these structures are: supra- and interspinous ligaments, ligamentum flavum, capsular reinforcements, intertransversarii, the posterior longitudinal ligament, and finally, the posterior portions of the disk. Avulsions of the spinous processes may occur, and Key and Conwell present a case of actual splitting of the spinous processes due to tension of the supra- and interspinous ligament.

In contrast, in the comminuted fracture the vertebra is flattened from above. It spreads out forward, backward, and sideways; and the effect is not so much the damage to the ligaments as that to the disk and the impaction of the intervertebral articulation.

ALL these secondary complications to the compression or comminution fracture of the vertebral body are responsible for the late sequelae to the injury. They are by no means always eliminated by skillful correction of the deformity, though it must be admitted that they occur much more rarely since the introduction of the hyperextension methods. One may well ask, "Why do sequelae occur at all if the primary treatment is adequate to take care of all injured structures, skeletal as well as ligamentous and muscular?"

For one thing, the primary fracture may be overlooked. We must remember that the diagnosis still depends largely upon the history: hyperflexion followed by localized pain in the back and pressure tenderness, with or without signs of radiation. The clinical picture may be dominated by indirect effects of the fracture. Navarre, for instance, called attention to fracture or dislocation of the sternum complicating fractures of the dorsal spine, and recently Bado described persistent and spontaneous sternal pain at Louis' angle with subluxation of the manubrium.

Another instance where fracture is often overlooked is in the osteoporotic spine. The injury here may be so trivial that no fracture is suspected. A slight jar or a ride over a bumpy road in an automobile may be sufficient.

Finally, sequelae occur when the reduction is incomplete, or when no reduction attempt has been made, or when retention of correction has failed because of inadequate plaster fixation.

What then is the nature of this secondary tissue damage and what part do its several components have in producing persistent complaints?

*The deformity*—It in itself is not disturbing because the gibbus is moderate. Nevertheless, patients complain of persisting pain even years after the injury. The reason for this may be threefold:

1. The disalignment itself produces unfavorable mechanical conditions for the back muscles and causes static fatigue and backache from muscular strain.

2. It is responsible for strain on the intervertebral articulations as they tend to separate or to impact.

3. The consolidation of the compressed vertebra is not always complete. The callus remains soft for a considerable time. In comminuted fractures where the disk is destroyed, fusion of the adjacent vertebra may develop; but this is not so in mild compression fractures where the disk is preserved. Thus it happens that severe comminution fractures healing by fusion may leave no symptoms, whereas mild compression fractures which are not fused may give sequelae for years.

Nonunion of fragments frequently causes pain. Bony spurs and bridges are usually seen in unreduced or poorly reduced fractures.

*Intervertebral impaction and injuries to the articulations*—With the compression of the vertebral bodies, the fragments may become impacted so that it is difficult to force them loose and to restore the normal height. The articulations are contused and smashed, and may become fused. There is, in addition, a variable amount of damage to the disk, and its disintegration results in the narrowing of the intervertebral foramina and in radiculitis with radiating pain.

Isolated fractures of the intervertebral disk are reported by Arcangeli with lateral protrusion.

sion, and there is also the case of 'T. Kocher authenticated by autopsy and described as early as 1896. Thus, although slight narrowing of the disk apparently does not cause persistent pain, marked narrowing due to disintegration may well do so because of the effect it must have upon the patency of the intervertebral foramina. The so-called meralgia paresthetica in trauma of the lumbar vertebra is due to destruction and compression of the disk, with narrowing of the intervertebral foramina. According to Watson-Jones, after reduction the intervertebral disk was found normal in 80 per cent of the cases.

A word may be said about so-called Kummell's disease or posttraumatic necrosis. This condition actually was first reported by Verneuil in 1892 and later was described by Kummell in 1894. It is supposed to be a rarifying osteitis due to vasomotor disturbances, which results in the breaking-down of the vertebral body long after the injury and in the formation of a kyphotic deformity. The characteristic feature is the period of latency between injury and deformity. The pathogenesis is still under controversy, but most authors now believe that there are minute fractures produced by the original trauma, and often a slight fracture, if untreated, may proceed to definite, painful kyphosis.

However, Gorsch in 1921, reported four cases in which the initial x-ray picture was found negative but in which later x-rays showed definite bony changes. This much is clear—compression fractures of the vertebral bodies that have no cord lesions often remain undiagnosed.

The intervertebral impaction is often seen in cases of osteoporosis, and it is remarkable how little impairment there often is to the ligamentous and other soft structures and how few are the permanent sequelae even in the face of multiple involvement of spinal vertebrae.

*The secondary arthritis*—Of all the possible sequelae of compression fractures, secondary arthritis is the most controversial point. Does the arthritis result from injury, is it aggravated

by it, or do the clinical and x-ray signs indicate that the degenerative arthritis of the spine developed independently of the injury? The relation of trauma to arthritis must be judged, first, by the adequacy of the injury; second, by eliminating such soft-tissue injuries as may simulate arthritis; third, by strict localization of the arthritis at the site or neighborhood of trauma; and, fourth, by the so-called "bridge symptoms," which means unbroken continuity of complaints from the time of injury, though subject to the usual fluctuations which characterize arthritis. Localized spondylitic changes in the x-ray picture are found probably in as much as 75 per cent of the fracture cases.

If the arthritis exists before the trauma, it is very likely that it becomes aggravated by it. How can we tell that it is a posttraumatic aggravation and, if so, how long should it last? Above all, it is the history which must answer this question. Any sudden and immediate increase of symptoms may be safely taken as due to trauma, and may be credited to it just as long as one would expect the natural repair of the trauma to require, considering the age and constitution of the patient, and provided that adequate treatment has been given, since without adequate treatment there may be no repair at all.

One should not rely too much upon the x-ray picture. Previously existing arthritic changes, such as spurs and bridges, may be entirely asymptomatic, and the superimposed aggravation is likely not to be represented by any x-ray evidence whatsoever. The exacerbations are caused by strains and ruptures of inelastic and often calcified ligaments and capsular reinforcements, and they are much better evidenced by symptoms of radiation and spasms than anything that can be seen in the roentgenogram. The x-ray does not indicate duration or intensity of the subjective symptoms or the degree of disability.

When the arthritis deformans has reached the stage of ankylosis, it is unlikely that it can be aggravated by injury, since the ankylosis represents a definite, permanent, quiescent stage.

Bone bridges at the fracture site do not nec-

cessarily mean hypertrophic arthritis. They are found in compression fractures oftener than in comminution (Watson-Jones). O'Donahue never found them in fractures successfully reduced by hyperextension treatment.

WHILE we are on the subject we should also mention the strains of the costovertebral articulation as sequelae to fractures of the bodies of the dorsal vertebra. It is obvious that deformity resulting from the vertebral wedging must have its full effect upon the thorax.

Goldtwaiter pointed out that as the chest sags and the head and shoulder are drooping forward a strain develops in the costotransverse articulations caused by a longitudinal twist of the ribs. From the upper ribs this strain may be thus transmitted to the sternocostal articulation. According to Brown, such strains vary with the anatomic type. In the slender type, where the facets sit at the anterior aspect of the transverse process, the downward slant occurs more easily than it does in the stocky type, where the costotransverse facets are placed nearer to the superior aspect of the process. When one sees how close the intercostal nerve lies and how taut the ligament and capsule of the costotransverse joint become with the drooping of the ribs, it is easy to understand that signs of strain of the nerve may develop, and, according to Carnett, many obscure thoracic and abdominal symptoms can be explained in this manner.

*Persistent muscular and ligamentous strains*—The greatest single factor to cause persistent pain in fractures of the spine are the strains and stresses of the ligamentous apparatus, especially the short articular, the intraspinal, intertransverse ligaments, and those of the extensor apparatus of the back, which includes the long sacrospinalis as well as the short and deeper layers of interspinali, intertransversarii, and levatores costarum.

We remember that flexion occurs in a transverse axis going through the midpoint of the body of the lower vertebra close to the overlying disk. This range is normally from vertebra to vertebra; it is 7 degrees between the

eleventh and twelfth dorsal, 6 degrees between the twelfth dorsal and first lumbar, and about 6 degrees between the first and second lumbar, according to Virchow. One may imagine what happens to the capsular reinforcements when a crushing injury causes enforced flexion of 20 or even 30 degrees.

The intraspinal ligaments and the ligamenta flava are still farther peripherally from the center of motion and therefore are under still greater strain on forced flexion. This strain manifests itself in deep-seated pain and tenderness associated with marked muscle spasm. It may cause the disability to be protracted over a year or more.

The disk itself suffers mainly from longitudinal compression, but there must also be a shearing effect, and the higher the vertebral junction the more must forced forward flexion be accompanied by shear, as the articular facets lose full contact and begin to spread apart.

As far as muscles are concerned, their strain in compression fractures can not be strictly differentiated from that of the ligaments. It would hardly be conceivable that a sharp forward flexion could occur without tearing some muscles, especially the deeper muscle layers. We call this traumatic myositis. In determining the relationship of myositis, the continuity of symptoms must be our guide just as it is in traumatic arthritis. An arthritis or myositis which is merely coincidental is likely to show a free interval. Muscular or articular damage which is an essential part of the fracture injury brings forth immediate, continuous, and, in case of neglect, increasing complaints from the time of the accident.

#### SPECIAL PAIN PATTERNS

The outstanding clinical feature of the persistent disability is pain—spontaneous pain, pain on motion, pain on pressure, local pain, radiating pain, and reflex pain. Others are paresthesias and muscular rigidity. At first glance, the pain manifestations are rather complex and the picture is confusing; closer study, however,

reveals that the pain appears in patterns, which differ according to localization and to the nature of the injury.

*Cervical*—This type of pain reveals a three-fold pattern.

1. Compression fracture of the upper cervical vertebrae are likely to involve the greater occipital nerve through injury to muscles and ligaments in the triangle between the rectus capitis posterior major and the obliquus capitis superior and inferior. This produces local tenderness at this triangle and radiation upward along the occipital bones to the top of the head

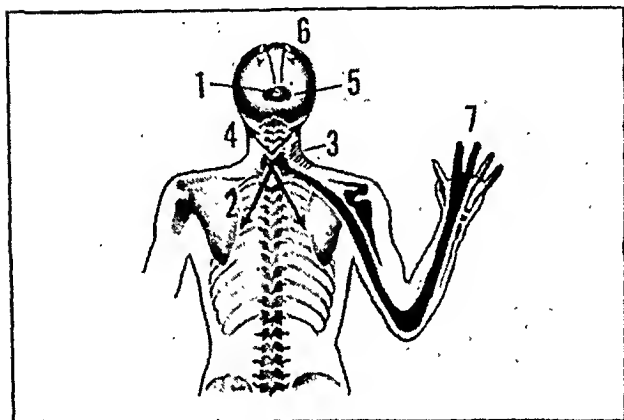


Figure 2. Local and radiating pain. Fractures of the cervical spine. (1) Occipital pain in fractures C4-5; (2) interscapular pain in fractures C6-7; (3) trapezius pain in fractures C7; (4) pain radiated to jaws in fractures C5-6; (5) pain radiated to base of skull in fractures C5; (6) occipitofrontal pain in fractures C5-6; (7) pain radiated to arm and fingers in fractures C6-7.

and even forward to the frontal bone. There is definite rigidity of the deep posterior neck muscles.

2. Compression of the midcervical vertebrae 3 to 5, injuring ligamentous structures around

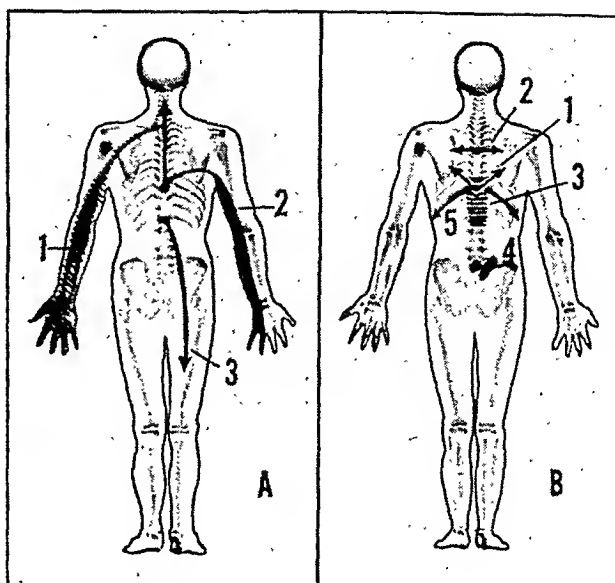


Figure 3. (A) Remote radiations. Fractures of the dorsal spine. (1) Pain radiated to arms and hand in fractures D1; (2) pain radiated to cervical spine, arms and hand in fractures D9; (3) pain radiated to thigh fractures D12. (B) Local and intercostal pain in fractures of the dorsal spine. (1) Intercostal pain to both shoulders in fractures D9; (2) pain to both shoulders in fractures D4; (3) mid-dorsal pain in fractures D8, D9, D10, D12; (4) lumbosacral, sacroiliac pain in fractures D12; (5) local and intercostal pain in fractures D7, D8, D9, D10.

the respective intervertebral foramina, may cause radiation along the superficial cervical plexus with its branches: articular, cervical, and clavicular.

3. Compression of the lower cervical, particularly 5 to 7, with injury to the soft structures around the foramina, will cause radiation along the brachial plexus and most often along the median nerve (paraesthesia of the second and third finger).

*Dorsal*—Local tenderness often persists, especially at the rhomboid region in crush fractures of the upper dorsal spine, due to unhealed injuries of the deeper back muscles and the ligaments in this region.

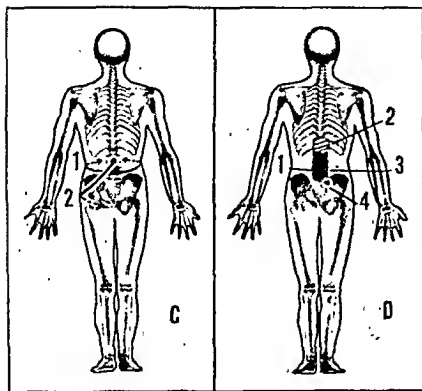


Figure 4. (C) Trunk radiations in fractures of the lumbar spine. (1) Girdle radiations in fractures L3, L4; (2) pain radiation to groin in fractures L2, D3. (D) Local pain in fractures of lumbar spine. (1) Pain upon spinal processes in fractures D12, L3; (2) pain upon dorsolumbar region in fractures L1; (3) pain over lumbar spine in fractures L3, L4; (4) pain over sacroiliac region in fractures L12.

Radiation along the intercostal nerves is frequent and persistent. Tenderness lateral to the spinous processes occurs in strain and injuries of the deep short muscles and to the costovertebral articulation and their ligaments.

**Dorsolumbar junction**—The encroachment of the intervertebral foramina in crush fractures of this region often produces radiation along the ilio-inguinal, iliohypogastric, and the external cutaneous nerves. The kyphosis which develops from poorly reduced crush injuries of the lumbodorsal junction undoubtedly has, by virtue of the compensatory lordosis, a static effect upon the muscles of the lumbar spine. Many patients persist in complaining of pain in the sacrolumbar and sacroiliac region, though the fracture site is the twelfth dorsal or first lumbar.

**Lower lumbar spine**—In this area the most

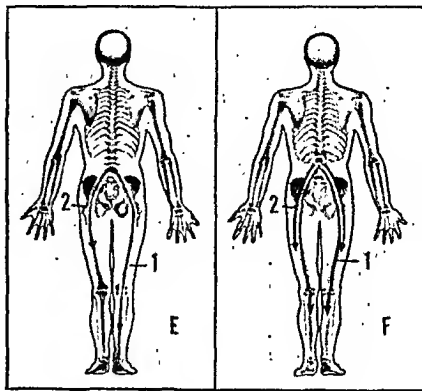


Figure 5. (E) Unilateral radiations in fractures of the lumbar spine. (1) Pain radiated to one leg in fractures L3; (2) pain radiated to one thigh in fractures L2, L3. (F) Bilateral radiations in fractures of the lumbar spine. (1) Pain along both legs in fractures L2; (2) pain radiated to both thighs in fractures L1.

common radiation is along the sciatic nerve. We believe it occurs only rarely by direct encroachment of the intervertebral foramen. More often it is caused by coincidental destruction of the intervertebral disk and occasionally it may be a pure reflex phenomenon connected with injuries to the sacrospinalis or to the deeper back muscles or to the adjoining ligaments.

THE conclusion derived from these observations on late, painful sequelae to the simple or comminuted fractures of vertebral bodies without cord injuries are simple and easily stated. There is, as you see, more to these fractures than meets the eye through the radiographic film. All such injuries must necessarily be associated with injuries to the soft structures, and, as in all skeletal injuries, the question

arises again: Are the measures these soft-part injuries demand, fully and adequately met by the treatment given to the skeleton, or do these soft-part injuries require special consideration over and above the skeletal treatment?

There is no doubt that reduction by hyperextension treatment of the fracture and adequate immobilization will take care of a good share of the muscular, ligamentous, and capsular injuries and will minimize the frequency of protracted and persistent complaints. Unfortunately, however, the majority of cases of crush fracture of the spine seen by the orthopedist show deformity due to failure of reduction. But even if reduced properly, the muscles necessarily become atrophic during the long period of immobilization; in this stage they are very susceptible to occupational and to static strains and thus keep up a continuous chain of subjective complaints. You will possibly recall that in recognition of this fact Magnus many years ago instituted his method of recumbent treatment with massage and exercises and without further immobilization. We should not advocate going as far as that. Yet, the principle of muscle development and exercise treatment is finding more and more acceptance among surgeons. Watson-Jones, for instance, advises exercises for spinal and abdominal muscles regularly for five minutes every hour of the day. After the cast is removed, which follows four months in compression fracture and after six months in comminution fracture, exercises are continued until normal muscle power is regained.

There will still remain some cases in which pain persists because the sustaining ligaments remain relaxed or because it is impossible to overcome the reactive spasm of the muscles and to restore them to normal power and endurance. For this minority of cases the fusion operation will probably be the only solution. In general, such operative interference is indicated for: (1) cases with persistent pain after months or years which resist all conservative treatment; (2) cases which are relieved only at rest and in which the pain returns on any kind of activity; and (3) younger patients who are relieved by

rest and who, by wearing braces, are sufficiently relieved to carry on a reasonable amount of work, but in whom pain persistently occurs when the support is discarded.

#### CASE REPORTS

A. Without radiation. S. M., 17 years old, had an accident in September 1939, resulting in a fracture of first lumbar. There was no reduction. The patient was first seen in October 1939, and complained of pain in F, the lumbar spine and a gradually progressive list to the left with limitation of motion of the spine in all directions. The patient was treated by head and pelvic traction on curved frame for two months. Later a body cast was applied and worn for two months, followed by a corset. In September 1940, the patient still complained of pain

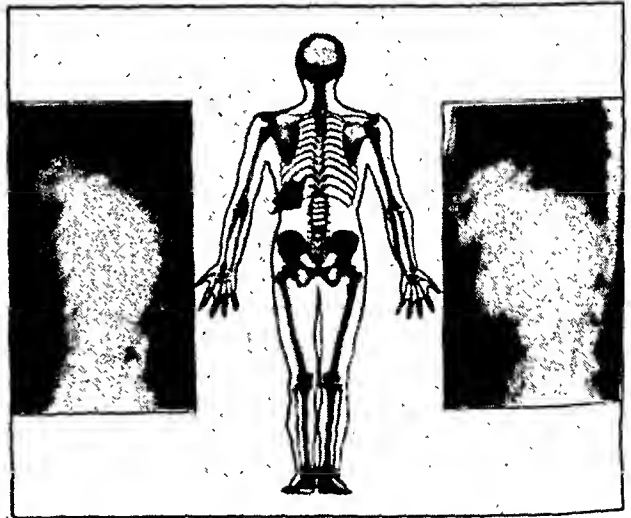


Figure 6. Local pain in fractures of the lumbar spine.

in F, the region between twelfth dorsal and third lumbar. Spinal fusion was performed. Result was complete relief of pain. Patient was last seen in September 1941.

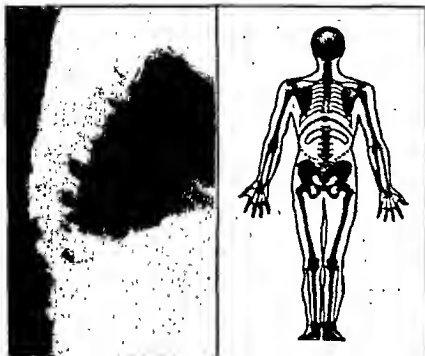


Figure 7. Pain radiation in fracture of the dorsal spine.

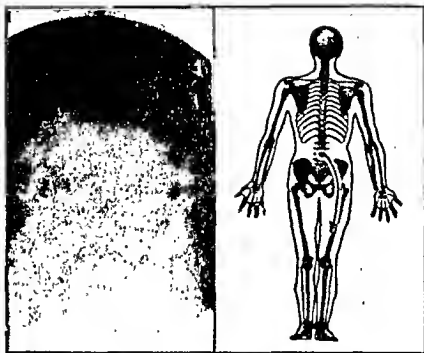


Figure 8. Pain radiation in fracture of the lumbar spine.

B. With radiation. D. I., 37 years old, had an accident in 1936, resulting in a fracture of F, the ninth dorsal. There was no reduction. She was first seen in 1937, complaining of back pain, aggravated by motion; she had no pain in the morning. The case was treated conservatively with only partial relief. In 1940 she started to complain of pain in dorsal spine radiating around both sides of F, abdomen to the umbilical region. She was put on bed rest without relief. Alcohol injection of the roots of the eighth, ninth, and tenth dorsals was performed, and following it she had complete relief of pain. This injection was repeated two months later because the symptoms reappeared. Later on, pain reappeared, and a chordotomy was performed. Results were inability to move toes, and involuntary bowels and bladder.

The third patient, 68 years old, had a trauma in 1932; there was no reduction. The patient was first seen in September 1936, complaining of pain in the lower back and coccyx, with radi-

ation to the posterior surface of the leg. The treatment used was physiotherapy and corset, which resulted in complete relief of pain. Patient was last seen in June 1941, five years later.

#### SUMMARY

1. Late and persistent painful sequelae are ever present in unreduced or poorly reduced compression fractures.
2. Complete reduction by hyperextension treatment greatly reduces, but does not entirely eliminate, incidence of persistent pain.
3. Fusion in cases without radiation, which resist conservative treatment, almost always gives relief.
4. Fusion in cases with radiation, which resist conservative treatment including recumbency, may not give relief if the radiation is due to herniation of the disk, or to nerve compression in the intervertebral foramina.
5. These cases need special surgical measures.



# The Diagnosis and Treatment of Peptic Ulcer

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THE STATUS of the ulcer problem is always worthy of review. There are many hypotheses as to the cause of ulcer but they are still, in the main, hypotheses. It is generally recognized, however, that acid is the most common factor associated with ulcer and recognition of this factor is largely the basis for the management of ulcer. Indications for choice of management, nevertheless, are still debatable because of the many factors which influence the results of treatment, and, although general principles may be set down, details of management vary with the lesion and with the individual patient. The evidence that management of ulcer is still a debatable subject is in the continued suggestion of new procedures, both medical and surgical, as well as in the revival of old and more or less discarded forms of treatment. There is also evidence that the disease itself is changing in its manifestations. It is for all these reasons that the subject is always a timely one.

Peptic ulcer is particularly important at present, since all disorders of digestion, whether of organic origin or not, assumed increasing significance during the war, and, in this postwar

period, probably will present to the medical profession problems which never before have been encountered in such degree. The evidence forthcoming thus far from our own armed forces and from those of other countries bears out the experience of the previous war that, in periods of national stress and strain, those conditions of which stress and strain are assumed to be directly or indirectly causative will appear in much greater incidence. Estimates in the armed services indicated that approximately 50 per cent of cases of dyspepsia were due to ulcer. Nevertheless, there may have been no actual increase in incidence of the disease as the result of war; possibly, the war merely drew attention to the fact that peptic ulcer and gastritis are of more common occurrence than was supposed. The army did not lose many useful men because of gastric disabilities.

The following interesting data were reported from the British Medical Services: In a follow-up study of 103 cases of perforated peptic ulcer in which operation had been performed at a Royal Naval Hospital between 1924 and 1934, 44 per cent of the patients were still on active duty in the Royal Navy in 1944. The interesting comment was made, moreover, that the higher the rank, the more likely the patient is to be able to carry on. It was also stated that

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neither length of history nor criteria for diagnosis offer any guidance as to whether the patient can withstand service life. The figures coming from the medical services of the various countries engaged in World War II are rather difficult to evaluate. In an article in the *Canadian Medical Association Journal* it is stated that the total incidence of gastric ulcer among casualties in the Red Army was 17 to 18 per cent. The interesting recommendation has been made that sufferers from functional dyspepsia should be kept on duty.

IN the diagnosis of peptic ulcer, great advances have been made through increased knowledge of the clinical manifestations of ulcer and through increasingly accurate use of roentgenology and gastroscopy. There are, however, and always will be, difficulties in interpreting dyspepsia and the relationship of ulcer to it. In typical cases of peptic ulcer, the diagnosis will be clear both from the history and from the roentgenologic report, but it is important to avoid the danger of focusing attention on the ulcer and overlooking other pathologic processes which might be of even greater importance. The diagnosis of gastric ulcer is seldom difficult. The only problem is whether or not the ulcer is malignant.

In contrast to the cases in which the condition is readily recognized, there are still many cases which present problems for the practitioner. First to be considered are those cases in which there is a good history of ulcer, but repeated roentgenologic and gastroscopic examination does not disclose the lesion. However, when a history appears typical to those with experience in this field, it is rare for ulcer not to be found if the patient comes to operation. Ulcers which cannot be identified are usually on the posterior wall of the duodenum, and deformity has not occurred or, if it has occurred, it has not produced any indirect signs which can be recognized in the roentgenoscopic examination.

The second important group includes those cases in which the symptoms may suggest ulcer



DONALD C. BALFOUR

but the continuity of symptoms is more suggestive of pylorospasm. It is in this group of cases that it is important, although difficult, to determine whether or not an ulcer exists in addition to spasm. There are, of course, many combinations of these atypical findings. One of the most important points, the reverse of which I already have mentioned, is that other lesions may mask the presence of the ulcer and give rise to a wrong interpretation of the symptoms.

Recently, I saw a patient whose major complaint was a sense of pressure in the upper part of the abdomen and lower part of the thorax, together with regurgitation of food. Examination elsewhere had disclosed a large diverticulum in the lower third of the esophagus. The development of the history was so completely directed towards its relationship to the diverticulum that a typical history of duodenal ulcer was more or less obscured. In further examination of the patient, a large duodenal ulcer was identified together with marked edema of the

pylorus and moderate pyloric obstruction. The diverticulum had been of such size and the patient's distress so marked that surgical removal of the diverticulum was contemplated. Indications, however, were completely changed when it was learned that many of the patient's symptoms were, in all probability, due to the ulcer. Then he was advised to go on an ulcer regimen, and the hope was expressed that, by dietary management, he might be able to control his symptoms to such a degree that operation for the esophageal diverticulum might be unnecessary and the possible serious outcome of such an operation, both immediate and subsequent, might be avoided.

**T**HE general indications for treatment of ulcer are rather well established. The following principles are generally accepted:

1. All patients who have duodenal ulcers in their early stages are considered amenable to nonsurgical management. I always have felt, however, that some surgical procedure might be developed for dealing with those ulcers which have become established even though, from a pathologic standpoint, they are only in their early stages.

2. It is said that nonsurgical management should be employed for cases of duodenal ulcers in which the symptoms are mild, recurrence is rather infrequent, and fairly good control by nonsurgical measures is attainable.

3. Certain small gastric lesions which can be carefully observed roentgenologically and, if necessary, gastroscopically are considered amenable to nonsurgical management. In fact, however, this type of management should not be employed in such cases since it is rather dangerous. Even complete healing of a small gastric lesion does not eliminate the possibility that the lesion harbors malignant cells.

In contrast to the indications for nonsurgical treatment, the indications for surgical care in the first group of cases are, in general, uncontrollable symptoms regardless of the time the ulcer has existed. A second group of cases in which surgical operation can be considered are

those in which the patients are unwilling to continue with strict nonsurgical management and prefer to undergo operation. This preference, of course, should not be given consideration unless the patient has had the ulcer long enough for it to be classified as a chronic lesion. As has been said, the patient may request operation rather than face certain minor adjustments. As long as this mental attitude remains, any treatment is doomed to failure. A third group of cases in which surgical measures are desirable is composed of those in which the circumstances of the patients make it extremely difficult for them to follow a regimen which will keep the ulcer under control. In a fourth group of cases, the indications for surgical operation are the complications which may be associated with the ulcer.

In connection with complications, one of the most interesting problems, which is still unsolved, is the significance of gastritis in association with ulcer. There is growing evidence that gastritis and duodenitis play quite prominent parts as precursors to ulcer, as factors in its recurrence, and as elements which influence the results of management. Experimental and clinical work bear out this assertion, but more knowledge is required to establish the relationships that have just been mentioned. Many observers believe that chronic gastritis is not only the background of peptic ulcer but also of pernicious anemia and carcinoma. But since duodenal ulcer, particularly in young people, may be associated with perfectly normal gastric mucosa, it would seem more logical to think that gastritis is secondary to ulcer. In the armed forces it is important to differentiate between so-called psychoneurosis associated with dyspepsia and chronic gastritis.

In cases of ulcer associated with hemorrhage the indications for surgical treatment are perhaps somewhat changed. It is accepted, of course, that it is safer for the patient who has repeated hemorrhages from an ulcer to undergo operation than to risk the results of further hemorrhages. The attitude of the medical profession towards the management of acute hemorrhages is gradually changing. It formerly

was accepted that, in the presence of acute, massive hemorrhage, a higher percentage of recoveries would follow nonsurgical management than surgical management, and much work has been done in an attempt to determine when operation would give a greater chance of recovery than would be given by nonsurgical management. Until recently most surgeons, I believe, felt that, although some patients would succumb to hemorrhage from a large eroded vessel, the difficulty of determining which case would terminate fatally, if operation was not performed, was too great to justify any surgical interference.

PRESENT advances in surgical management of ulcer, however, particularly with respect to the use of blood and blood substitutes in cases of massive hemorrhage and shock, would seem to indicate that radical surgical measures and replacement of blood could be carried out without prohibitive mortality in cases in which bleeding is obviously continuing. Such management, of course, is more clearly indicated if patients are beyond middle life than if they are younger, for it has been shown that the mortality rate of gastric hemorrhage from ulcer is chiefly in this older group.

A word about acute perforation of ulcer: Expertness in diagnosis, skill in technic of gastric operations, and the use of chemotherapy have helped to further an ideal in the management of acute perforation. That ideal can be expressed as follows: Not only should surgical measures save the life of the patient but they should give the highest measure of protection against recurrence of the ulcer and of another perforation. Also, more radical procedures for acute perforation than simple closure should not be carried out unless they can be done as expeditiously as the practice of modern surgery makes possible.

I shall now return to some of the major principles in the management of ulcer. The success of nonsurgical treatment is in direct proportion to the patient's understanding of the dis-

ease, and it is therefore essential that the full and continued cooperation of the patient be obtained. "Unfortunately, the characteristics of restlessness and irritability which play such an important part in the development of the ulcer make it difficult for the patient to cooperate with respect to treatment. However, he must be made to understand that there is for him no easy road to health and that his cooperation must extend over a period of years rather than days and during long intervals when he is asymptomatic and when he thinks his ulcer has been cured. Too often the ulcer patient's perennial optimism is a most serious pitfall; he is ready to follow a treatment program when suffering pain, but it is almost impossible to get him to maintain adequate precautionary measures when he is comfortable."\* It is for this reason that hospitalization is so essential, for, in a few days in the hospital, a physician can usually convince the patient that there are factors in the causation of ulcer over which the patient himself has control and that, in the long run, success will depend largely on how conscientiously he adopts simple rules as a part of his routine of living.

Concerning cases in which surgical management is indicated, certain general principles might be pointed out. Of these, the cardinal principle to be followed—and this applies also to nonsurgical management—is that the objective is to modify gastric physiologic processes. To what degree they should be modified, however, is still to be settled. In gastric ulcer the problem is simple, because one of the requirements of operation is that the ulcer should be removed and the operation of excision and gastroenterostomy usually gives satisfactory results, both because symptoms are relieved and because jejunal ulcer is an extremely rare sequel. Partial gastrectomy, however, has become the operation of choice. It is interesting to note, in this connection, that extensive gastric resection for gastric ulcer is not emphasized as a protection against recurrence of the ulcer; this is further proof that the liability to recurrence after

\*Morlock, C. G.: The present status of the treatment of uncomplicated duodenal ulcer. *Proc. Staff Meet., Mayo Clin.* 19:449, 1944.

any operation for gastric ulcer in which the jejunum is united to the stomach is minimal.

IT is concerning duodenal ulcer that much discussion continues as to the best surgical procedure. One of the most interesting chapters in the history of surgery has been the one which might well be entitled "From Pyloroplasty to Gastrectomy." The great number of operations and combinations of operations that have been employed have the same purpose, namely, to reduce the motor, sensory, and secretory mechanism of the stomach to a point at which ulceration will not recur. The ideal surgical treatment of duodenal ulcer, therefore, might be expected to be derived from application of those procedures which in the past have given excellent results in certain groups of cases. The difficulties of decision, however, have been great because of uncertainty as to the degree of ulcer diathesis presented by different patients. In some cases, simple pyloroplasty would give permanent and splendid results, whereas, in other cases, the same operation, under apparently the same conditions, would be followed by recurrence of ulceration. For this reason, many other procedures designed to control hyperactive gastric function have been abandoned in favor of partial gastrectomy. To give no consideration to any other surgical management would be a questionable course, however, for two important reasons: (1) These other procedures will, in certain cases, give excellent and permanent results; (2) as yet, the late results of extensive partial gastrectomy performed on young persons is unknown.

Finally, another word about recurring ulcer: This lesion may occur after any type of operation, and it has now been proved that partial gastrectomy does not by any means guarantee that an ulcer may not develop. As a matter of fact, in institutions wherein partial gastrectomy has been performed in the greatest number of cases, relatively recent reports show that ulcer has recurred in more than 9 per cent of cases. This illustrates a principle; namely, when ulcers recur, there exists in the affected patient a particular tendency to their recurrence, and the circumstances necessitate a more radical change in gastric physiologic processes than has been brought about by the operation performed. When this marked liability to recurrence is encountered and the jejunum is quite obviously expressly vulnerable to gastric juice, an operation which will restore direct continuity of the stomach and duodenum has an advantage in principle. This is particularly true if repeated gastric resections have been done for recurring ulcer. In such cases, it is well to disconnect permanently the jejunum and the segment of remaining stomach and to unite this segment and the duodenum.

In general, the status of peptic ulcer today is one of which the medical profession may be proud. Recognition of the disease has taken its place among the great advances in medicine; nonsurgical management has become much more efficient than it was; and surgical treatment has become better understood, particularly in regard to the selection of patients for operation and in regard to the selection of operation for the patient.

# Diagnosis and Treatment of Schizophrenia

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ABOUT fifty years ago there were so many different kinds of "madness" in the books, or at least on the registers of the state hospitals, that all psychiatrists welcomed the work of Emil Kraepelin of Germany who proposed to group together quite a few rather widely dissimilar conditions into one large category which he called "dementia" (because these conditions all seemed to have a malignant tendency and to tend toward deterioration) plus "praecox" (because this deterioration seemed to begin early in life). While it was a great step forward for him to group all of these conditions together and to invent this term "dementia praecox," it was subsequently discovered that his inclusions had been rather too broad, and that his inferences as to the malignancy of the condition, its deteriorating tendency, and its "precocious" appearance were somewhat unjustified. The name had the effect of making psychiatrists even more pessimistic than the public; if a patient developed symptoms that could be put into this general category of "dementia praecox," it became almost a foregone conclusion that the patient was hope-

less. The doctors felt that way and acted that way, with the result (partial) that the patient often turned out to be that way. This is in spite of the fact that Kraepelin himself specified that a very considerable proportion of these patients seemed to recover.

Then a Swiss psychiatrist by the name of Bleuler came along who pointed out that the fundamental similarity in these cases was not the tendency to "dement," nor yet the tendency to begin early, but rather certain psychological peculiarities which could best be described as a kind of splitting of mental functions, a disturbance of the powers of association and of the normal connections of the emotions with ideas. He introduced the name "schizo" (split) "phrenia" (mind).

Before I plunge into the details about schizophrenia, I would like to talk rather more generally about the fact that doctors are so little prepared for seeing the indications of schizophrenia as compared to their preparation for seeing the indications of coronary sclerosis. It is generally agreed, I believe, that in the practice of medicine—outside of a few specialties—at least one-half of the cases which the average doctor sees in his office are cases of illness the like of which he never saw in medical school, the nature of which he was taught nothing

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about in medical school, and the treatment of which has to depend upon his ingenuity, his common sense, and his temperament rather than upon any scientific training that he has had in the past.

This 50 per cent of the practice of the physician is made up of conditions that are sometimes described in a broad way as psychiatric in nature. Perhaps we should put it a little differently and say that they are cases in which psychological and social factors determine the symptomatology more than do spontaneous or traumatic organic lesions. I find it helpful to think of it this way: Perhaps a third of medical practice consists of cases of organic pathology of the type shown in the scientific exhibits of every good national medical meeting. Another third of this practice is made up of cases in which there are a good many physical indications of illness, but indications connected so closely with the emotional life of the patient that while the doctor may begin by treating a part of the patient—his back or his head perhaps—he ends up by having the whole patient to treat, with all his troubles, his marital difficulties (sometimes his extramarital difficulties), his economic difficulties, and everything else. The final third of the cases constituting the practice of the average physician is made up of patients who certainly are obviously psychiatric; they are cases in which symptoms are many and the signs few, in which undoubtedly the patient suffers, and usually the doctor. The patient has symptoms that distress the doctor partly because he (the doctor) doesn't know what to do and partly because whatever he does seems to be wrong. Or the doctor may realize that the proper consideration of the patient's symptoms take so much more time than the doctor has available in his busy life that he enters into any treatment at all with a certain grudge against the patient which defeats him before he starts. Hence very often he gets rid of the patient as rapidly as possible with the hope that someone else will do the job.

The patients in this third category go by various names. Not all of them, by any means, can be said to suffer from neuroses, though of

course many of them do. Some of them are suffering from something more malignant. It is a very common error on the part of the general physician to think that any patient whose complaints seem grossly to outnumber his physical signs of illness is a neurotic. Many of them are not neurotic but *psychotic*.

WHAT is the difference between psychotic and neurotic? In everyday language you know well enough what the difference is. A psychotic man, a patient with a psychosis, is what is popularly known as "crazy." He is irrational, he is unpredictable, he is not entirely responsible, he is perhaps potentially or actually dangerous to himself or to the community. Such indeed is the picture of the full-fledged psychosis in most instances. But in the early stages a psychosis does not take on these malignant features. It may appear very much more in the form that many physicians regard as typical "neurosis," i.e., a condition in which the patient complains a great deal about something for which there seems to be no organic cause.

The commonest psychosis which masquerades as a neurosis—or sometimes as a mild physical ailment or even as a surgical condition—is schizophrenia. Schizophrenia is one very important, if not the most important, form of serious, malignant mental illness. By malignant I do not mean that it is incurable; a great many cases of schizophrenia do not become seriously ill, and a large number of them recover even after they have become seriously ill. But there are so many cases of this illness in the country that it is still possible to say that a large number go through your office and are called by you cardiac disease, appendicitis, malingering, and neurosis when they are actually primarily just plain schizophrenia—a fact which will probably sooner or later become evident. In any psychiatric hospital most of the patients with well-developed schizophrenia have been previously treated by doctors who thought the patient had a physical disease or a neurosis.

"What is this schizophrenia, then? Surely it is something that I am missing, for I do not see

very many cases in my office that I would consider psychotic. You say it is so common, but I'll have to be convinced. I am sure that I did not remotely suspect that I was seeing it."

You are quite right; I am sure that you did not suspect it. In order to make you more suspicious of the existence of such cases, let me cite a few examples.

You are called to a private home to see a young boy of 18 or perhaps a woman of twice that age. The family tells you that this beloved member has been acting queerly, talking somewhat irrationally or inconsistently, and in general showing strange, pointless behavior out of keeping with his or her previous pattern. The chances are ten to one that you are observing an acute instance of schizophrenia and that you are well aware of it. Naturally you would exclude febrile delirium or hysteria—both of which are relatively rare—or intoxication—regrettably somewhat more common—and other conditions which it might be. Excluding these conditions you are almost certainly right that this is a case of schizophrenia. Inquiry from the family will probably supply the information that this strange behavior has been rather irregularly developing over a period of several weeks or months. The symptoms may have been of a quiet, silly, dreamy type, or they may consist of more or less hostile, suspicious, sullen, and delusional behavior, or they may be of a noisy, combative, disorderly type. We are all familiar with these three general pictures of disturbed (psychotic) behavior; what is common to them all is their irrational, illogical, unpredictable nature.

SUCH cases are easy to recognize, as I have said. Any good third-year medical student would be able to recognize them if he had had any psychiatry at all. But such a case represents only one stage of schizophrenia, an acute advanced stage of the disease. It is a little like a hemoptysis in tuberculosis. A sudden hemorrhage in a person who is not suspected of tuberculosis startles us, and we wonder why we have not noticed it before. We know that a process

has been developing over a period of time. Such a patient bleeds, he is rushed to a sanatorium, gets early treatment and has a better prognosis than the man who is suspected only of having a chronic cough or a bronchiectasis or something of the kind and is given no treatment until he is thoroughly under the domination of a tuberculous infection.

Something of the same sort is true in schizophrenia. The type of case I have described is easy to recognize, and it is apt to be rushed away to immediate treatment and thereby get better treatment and better results than the more slowly developing cases which are far more common. I would say that the slowly developing cases are ten or twenty or maybe even fifty times more common than the picture that I have just described. It is important for the doctor to know these cases in their earlier stages, if possible. Therefore, having given you this rather typical picture of the advanced case, let us get back to the earlier symptoms that one might have noticed in the same young man or woman had we seen him or her a year or two years or five years earlier.

In the advanced stages of schizophrenia it is easy to see that the patient seems to have abandoned his loyalty to reality and his common-sense discriminations with reference to the facts of life that we have all learned about through painful experience, and he seems to act as if he were in a dream. Indeed, schizophrenia has sometimes been likened to sleep-walking. The characteristic thing in a dream is that the laws of gravity, time, space, color, identity, and the like no longer hold. This is precisely the way a patient with advanced schizophrenia acts; he acts out a dream instead of acting according to reality.

In the earlier stages of schizophrenia one can often detect this unrealistic, impractical, dream-like quality, but only by careful scrutiny. The trouble is that so many people—all of us in fact—have spells of it that it is a little difficult to say which person is developing what might be called a malignant dreaminess, a malignant impracticality, and unrealistic attitude or approach to life. We all do a certain amount of



daydreaming, self-deception, and scotomatizing of realities. But the normal person has a tendency to "come back," or to "snap out of it," and to pitch into life again for what it actually is and not for what he wishes it were. The potential schizophrenic patient, however, has a tendency to go the other way as if he found the world of real life too painful to endure.

I am well aware of the fact that I have made this appear much too simple. A sensitive child grows up in what is for him a harsh world or a cruel world, and instead of committing suicide he merely relapses and regresses into a dreamlike state, which becomes more and more obvious, and there you have it—schizophrenia. The only trouble is that that isn't the way it usually happens. Plenty of children grow up in what appears to be the best of environment and yet develop schizophrenia, whereas plenty of others grow up amid hardships and sufferings aplenty and come nowhere near having schizophrenia. Indeed, some of the latter seem to be all the more realistic in their adjustments.

THIS has led many psychiatrists to believe that a special tendency to schizophrenia, some kind of hypersensitiveness at least, is transmitted by heredity. There is no proof of this, however. There is much proof that the injuries suffered by those individuals who later become schizophrenic occur very early in infancy. It may be the death of a mother, neglect or harshness by the mother in a form which she herself does not at all recognize, incessant quarreling between the parents, hopeless rivalry with a much more popular or much more beautiful sister—all these things can do it, and many more which occur even in the most gentle and kindly and affectionate of families.

In general, what happens is that something in the nature of an unendurable disappointment or wound causing unassuageable anger occurs in a person with a special sensitiveness and with inadequate devices for psychological adjustment. I trust it is clear that such an individual doesn't develop schizophrenia right away. He is only a 2-year-old child, let us say, or 3 years,

or 4 years at most. Many other events happen subsequently which reinforce the original injury. It may well be that there is a certain unfortunate concatenation or repetition of such blows that actually causes the illness.

Children injured in this way are apt to develop certain defenses. They "cover up," as the slang expression puts it. They deny the injury which they have experienced or the pain which they are suffering. They erect a façade or front. "All's well with me," they seem to say, "I am one of the fellows; I am just like everybody else. I am a normal person." And indeed they act like normal persons, as much as they can. They go to the same schools, they complete the same work, they do the same things that all the rest of us do. Often they are noticeable only for a certain reticence, shyness, or perhaps a slight eccentricity. Just as often they are not conspicuous at all. So much of this depends upon their ability or luck in maintaining this false front.

What is underneath that front? One might say that the same sort of thing goes on in the emotional life that goes on when an abscess slowly develops beneath the surface of the body, for example, in the lungs or in the liver. There has been an injury, an infection. Counteracting processes have been set up so that tenseness and pressure and potential pain are gathering. But all this is concealed from the outsider. If such patients subsequently develop schizophrenia, we know that long before the outbreak of the illness there is evidence of an intense conflict, tension, and anxiety, and strong feelings of bitterness, resentment, and hate toward those very people with whom the external relationships may be perfectly normal. "I hate them! They don't treat me right. They will never love me and I will never love them. I hate them and I could kill them all! But I must not let them know all this. I must cover it up, because they might read my thoughts, and then they wouldn't like me and wouldn't be nice to me." All this is covered up by trivial conversation, pleasant greetings, chat about the movies or the picnic and the next dates, and the rest of the ordinary things of adolescent or early adult life.

Thus, one might say that the chief problem in the person who is going to develop what we call schizophrenia is, "How can I control the bitterness and hatred I feel because of the unendurable sorrow and disappointment that life has brought to me?" His efforts to control it often show themselves in various kinds of withdrawal: lone-wolfishness, seclusiveness, even mild suspiciousness, or just a quiet going of one's own way with disinterest in active social participation.

It is this which we must consider to be the earliest signs of the unrealistic qualities which I mentioned above as being typical for this condition. It is very difficult to detect these things. I can assure you that every psychiatrist has a great many cases in which he finds it difficult to decide whether or not the patients are potential schizophrenics. He often cannot decide even after he has obtained a complete life history, though by then it may be simpler.

**F**ORTUNATELY, we are not entirely helpless in the matter of diagnosis, however. Many of you will recall that before the Wassermann test for syphilis was introduced, a man was not recognized as having syphilis unless he had open lesions or some of the other well-known clinical manifestations of syphilis. Sometimes we were not certain about the diagnosis from the observation of the lesions alone and in these cases particularly we were very glad when the Wassermann test was discovered and proved to be of clinical usefulness. Then we discovered that many had syphilis who had no visible lesions at all!

In the same way there have been devised psychological tests which are useful to psychiatrists just as a Wassermann test is useful to an internist. They not only help to make a definite diagnosis in doubtful cases, but they can be applied to apparently normal patients, and in such patients they reveal the presence of schizophrenic tendencies which do not show in any clinical way.

The average psychiatrist cannot do these tests. I cannot do them any more than I could

do a Wassermann test, though I learned about it in medical school. But I do know what the results of a Wassermann test mean, and I do know what the results of such psychological tests mean, and I respect them equally. Using such tests, we know now that a great many cases that we used to call neuroses, neurasthenia, alcoholism, chronic invalidism, and many other things are actually cases of schizophrenia. Hence, today we have a concept of schizophrenia very much broader than the one we used to have in the old "dementia praecox" days. We know now that there are actually many schizophrenics who do not become patients—indeed who never become patients, neither yours nor mine. They often do very creditable and capable things in the world. Nevertheless, they are potential schizophrenics.

As in the case of coronary sclerosis and diabetes, the regimen under which they live has much to do with their successful adaptation. Given certain new stresses, the facade may break down and the underlying bitterness and conflict may break through. The patient may suddenly begin to hear voices talking about him saying that he is mean, that he is hateful. Or he may begin to detect the hostility of other people in a far larger measure than could possibly be true. He may begin to consider himself persecuted.

Or the break-through may be like this: A little girl who was one of the most popular members of her community; president of her high school class, and prominent in her Sunday school, calmly walked into her father's bedroom one night and shot her father with a revolver. Then to help matters along, she went into the next room and killed her brother. The following day she was the same "sweet, pleasant, demure, but somewhat shy girl" that she had always been. No one could believe, at first, that she had really committed the double murder. No one could believe, either, among those who knew and loved her, that she had schizophrenia. But the psychological tests showed it very clearly. One reads about cases like this in the newspapers very frequently.

THE most important cases of overt schizophrenia are not those in which the break-through appears in such aggressive and violent, direct action as I have described. In fact, most cases of schizophrenia are not dangerous. The commonest type of break-through, the one that is most familiar to the doctor, is that in which the conflict appears in the form of physical symptoms. These physical symptoms usually appear as chronic pains in the abdomen or in the back or in the head. I could fill many pages with case histories of such. A very successful saleswoman began to feel nervous and jittery when she was 44 years old. This was ascribed to the menopause. She began having recurrent attacks of pain in the back, feelings of anxiety, and tremblings of the hands. She was given the usual medication for the menopause. This was of no particular benefit to her. She went from physician to physician; during the year in which she was examined by me she had seen 8 other physicians all of whom had assured her that there was nothing seriously or organically wrong. However, a careful psychiatric examination, confirmed by psychological tests, showed that there was something very seriously wrong; she was developing an overt schizophrenia. A year later she was in the locked wards of a psychiatric hospital.

The surgeon sees more of these cases even than the medical men, I suspect. And the surgeon is apt to be taken entirely unawares by them. I am not talking now about those cases which develop schizophrenic symptoms after an operation. This sometimes occurs. I am speaking of cases who come to surgeons with symptoms that suggest a so-called chronic appendicitis and other vague surgical affections. Sometimes the operation is very definitely indicated. Furthermore, the curious phenomenon is often observed that an operation seems to postpone the outbreak of schizophrenia and sometimes to control it. I have seen many of these patients who have had operation after operation each time based upon physical symptoms to be sure, but symptoms which developed in connection with the threatened outbreak of their schizophrenic tendencies.

I certainly don't mean by this that I think surgeons should operate merely for the purpose of forestalling schizophrenic attacks. Sometimes it has the opposite effect as I have already mentioned. Furthermore, no surgeon wants to have his surgery turned into a placebo method. As yet we do not exactly know what to do with such patients, and it is a safe rule that the best thing to do is simply to follow the necessary indications for imperative surgery.

When a case is definitely recognized to be one of schizophrenia, most physicians want to get rid of that patient. In this they are very wise. Of the many psychiatric conditions which physicians and surgeons who are not psychiatrically trained can and should handle, schizophrenia is not one. By its very nature, as I have described it, which is that of repudiating reality and living in a self-limited, self-defined, self-created, self-ruled world, the schizophrenic patient puts himself outside the jurisdiction of conventional medical practice. All psychiatrists believe and advocate that general physicians, internists, and surgeons should treat many psychiatric patients. They have to, as a matter of fact. There are not enough psychiatrists to take care of one-fourth of the number of psychiatric patients now known to be seeking medical help, and there will not be enough psychiatrists for many years. But in spite of this, I do not think that physicians and surgeons should attempt to treat schizophrenic patients. They are the most difficult, the most delicate, the most potentially disastrous of all psychiatric patients.

I know that some physicians feel justified in administering electric shock treatment as soon as they detect what they consider to be schizophrenia in a patient. Psychiatrists in general, and I in particular, strongly condemn this procedure. In the first place, electric shock is by no means the treatment of choice—if indeed it is of any use whatever—in schizophrenia. Insulin shock is sometimes beneficial, but it should be done only by someone with a great deal of experience in the selection of cases and in the administration of the treatment. Furthermore, it is generally agreed among psychiatrists that the effective use of any kind of shock

therapy involves the strategic application and careful timing of psychotherapy, and to do this without preparation simply because one can apply an electrode or give a drug intravenously is both dishonest and dangerous. Indeed, it is, in my opinion, malpractice.

NO, THE treatment is not shocking the patient, but just the reverse. When it can be accomplished, the favoring of a natural reconstruction of the front that I have described, the encouragement of a psychological healing process within the patient by the proper kind of environmental situation and the proper attitudes on the part of the people about the patient—that is the treatment of choice. In very simple words, I mean that such patients often recover if placed in an environment in which it is not necessary for them to be afraid of their own fearful aggressiveness and resentment. Having been relieved of this fear, they can gradually and firmly reconstruct the front with which they ordinarily meet social contacts. Often, but by no means always, this means an institution; perhaps much more often it means finding an environment in which, outside of an institution but often outside of the home, the patient can successfully adjust himself. Above all, such patients should not be allowed to get into situations which they cannot stand, and if they are already in situations that they cannot stand, they should be removed to situations which require less of them.

Whether a patient requires, in addition to such a change in his life situation, the special psychotherapeutic treatment which a psychiatrist can give would depend upon the individual case and upon the severity of the symptoms. The vast majority of schizophrenics at the present get no treatment, but many of them would be very much helped by some protective, supportive treatment which their family physician could give them. A great many could undoubtedly be improved, if not cured, by the proper type of special psychiatric treatment.

The prognosis of schizophrenia is much better than most people think. If one is going to judge it by the terrible cases—and they are too many and too terrible—that never get well, cases which fill the state hospitals, then one has a right to be pessimistic. But one should remember that these thousands constitute a *small minority* of the total number of cases of schizophrenia. I am not speaking now of the latent cases of schizophrenia, but even of the overt cases. If a medical student was shown only the advanced, ulcerative, disseminated stage of carcinoma, he would certainly come to the conclusion that it is an incurable disease. Yet we all know that early cases of carcinoma can be successfully treated and are being successfully treated. *Schizophrenia has a much better prognosis than carcinoma*, and on the same basis, namely, that it be recognized early for what it is and not taken to be something else—appendicitis, or neurasthenia, or idiopathic pruritis vulvae, or idiopathic this or that.

# Case of Situs Inversus Totalis

## DISCLOSED BY THE PRESENCE OF THE VERMIFORM APPENDIX IN A LEFT INGUINAL HERNIAL SAC

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IN 1938 the author<sup>1</sup> reported the unusual case of acute appendicitis in situs inversus totalis as a complication in a patient who was four months pregnant; appendectomy was followed by uneventful recovery.

Recently, a second case of complete situs inversus was operated on by the author, this time for a twice recurrent left inguinal hernia where the presence of the vermiform appendix (as well as part of the cecum as in a sliding hernia) in the hernial sac disclosed the existence of situs inversus which was not known preoperatively. Since the explanation of situs inversus, as well as a review of the literature, was presented in the first report referred to above, this phase of the subject will be omitted.

The usual contents of an inguinal hernial sac are small bowel and omentum; the presence of large bowel is unusual—if present, it is called a sliding hernia with the posterior wall of the sac covering the large bowel. The sigmoid (more freely movable) is found in left inguinal hernia much more frequently than in a cecal hernia on the right. Occasionally a cecal hernia occurs on the left when trac-

tion of the ileum already in the sac probably draws the cecum in also, or when a very long ascending colon permits the cecum to fall into the pelvis. The presence of the appendix in a hernial sac is of great importance since it may be the seat of inflammation, gangrene, etc. Although important, the presence of the vermiform appendix in a right inguinal hernia is not rare, but its occurrence as part of the contents of a left inguinal hernia is rare enough to warrant presentation of such a case.

The explanation referred to above of traction of the ileum in a left inguinal hernia pulling the cecum and appendix into the sac is a probability, but the existence of situs inversus must be kept in mind. Most cases of situs inversus reported in the literature were disclosed accidentally, usually by routine roentgen study of the chest where a dextrocardia suggested the possibility which was substantiated by barium enema studies. The cursory examination of the chest in most surgical emergencies, as well as in routine cases such as hernias, gives no clue to the existence of a dextrocardia. It is of real importance to the surgeon, as well as to the patient, to know that situs inversus is present.

The incidence has been variously reported. Sher<sup>2</sup> in 1922 reported the occurrence of situs

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inversus 10 times in 347,000 cases at the Mayo Clinic over a ten-year period. Willis<sup>3</sup> in 1925 reported 3 cases in 10,000 admissions; from x-ray studies, LeWald<sup>4</sup> reported the incidence to be 1 in 1,400. Adams and Churchill<sup>5</sup> reported situs inversus occurred 23 times in 232,112 patients at the Massachusetts General Hospital or about 1 in 10,000. In 1944 Prescott and Zollinger<sup>6</sup> reported 3 cases among 15,347 admissions to an Army Station Hospital at Madison, Wisconsin.

Haddon<sup>7</sup> reported a case of left-sided appendicitis where an appendectomy was done for an acute gangrenous appendicitis. The patient died on the fifth postoperative day and post-mortem examination revealed the cecum to be in the left iliac fossa together with the sigmoid; the ascending colon went obliquely from the left iliac fossa to the right hepatic flexure, and the small bowel was entirely on the right side. No other transposition of viscera was present. Haddon has therefore suggested that the actual conditions resulted from failure of rotation of the midgut loop, which occurs at the tenth week of fetal life, allowing the cecum and colon to enter the abdominal cavity first instead of the normal midgut. This patient therefore does not present a picture of true situs inversus.

#### CASE REPORT

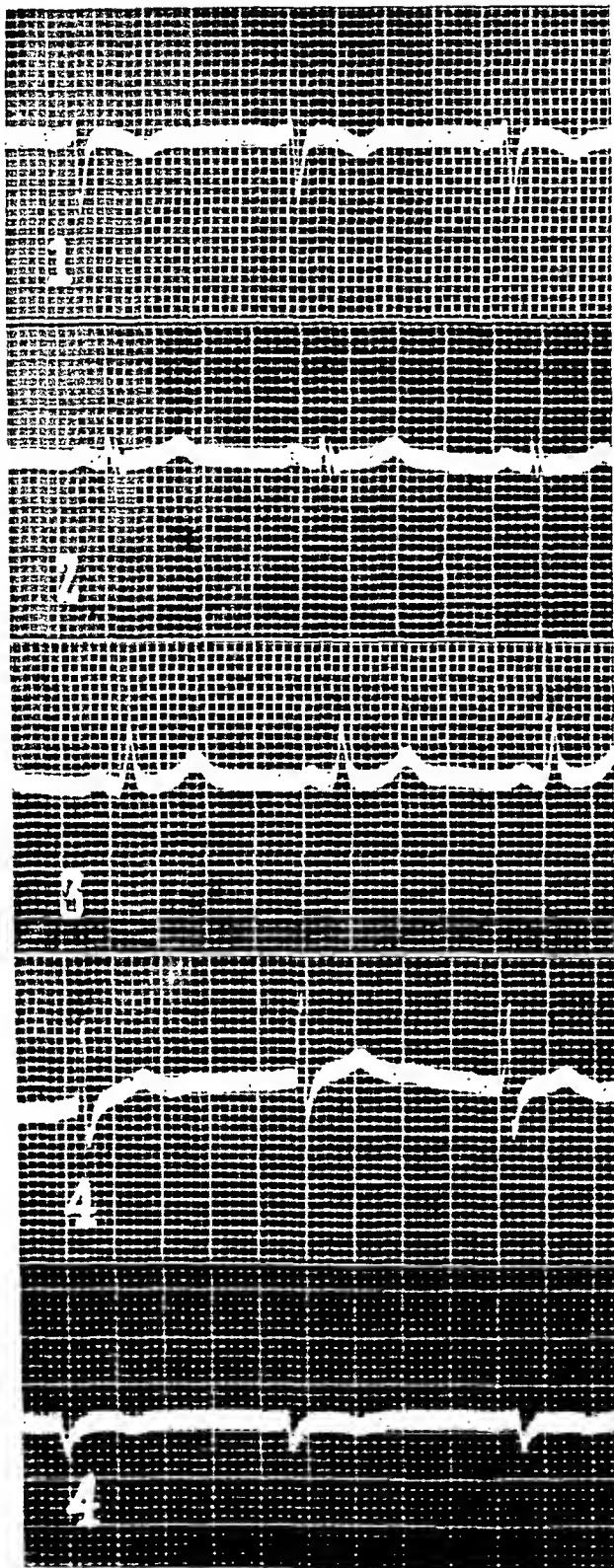
The patient, a white male, age 43 and married, was admitted to the surgical service of the Veterans Administration Hospital at Butler, Pa., for the repair of a twice-recurrent left inguinal hernia. This veteran had his first hernia repair performed in 1920 while in military service. A recurrence was noted in about three years, followed in a few years by the development of a right inguinal hernia. In 1936 an operation was performed, and a bilateral inguinal hernioplasty done. Within two months the patient noted some weakness in the left side, followed by a slight bulge. In 1939 he was hospitalized again and a diagnosis of recurrent left inguinal hernia was made, but at this time, he refused operation. This defect continued up



MAURICE A. MICHAEL

to the present time and has steadily become larger. He has worn a truss for five years to support the left side. No recurrence exists on the right side. This patient is a truck driver, had one year of military service in 1920, is married and has two children living and well. He never had any unusual or serious illnesses or injuries.

Physical examination revealed a well-developed, white, adult male who was not acutely ill; he wore a truss on the left side. Blood pressure was: systolic, 133; diastolic, 80. Head and neck were negative. Chest examination showed the heart sounds to be good and the lungs to be normal. There is a right inguinal incisional scar. Two inguinal incisional scars are present on the left, and a fairly large defect is noted on the left at about the level of the internal ring. Preoperative impression: recurrent left direct inguinal hernia. Urine, blood, and serology were essentially normal. Preoperative chest examination by anesthetist revealed no contraindication to surgery.



WITH the patient under spinal anesthesia, a left inguinal incision was made between the two incisional scars. The incision was carried down through the skin and subcutaneous tissue, and at its upper end, beyond the scar tissue, the external oblique aponeurosis was identified. By scissors' dissection, the external oblique aponeurosis was cleaned off laterally and down beyond the external ring. The incision was then made in the external oblique aponeurosis through the external ring; the spermatic cord was identified and mobilized on cord tape. Examination for indirect hernia was negative, but just below the level of the internal ring and mesial to the cord, a moderately large hernia was found in the transversalis fascia.

The hernial sac was opened by incising the transversalis fascia and peritoneum. Many omental adhesions attached to the inner portion of the sac were clamped, cut, and ligated. On the upper lateral portion of the sac was found the large bowel, which made up the posterior wall of the sac. Extending from this bowel was the vermiform appendix, thus making the large bowel cecum and the type of hernia a sliding one. The appendix was removed by the clamp and cautery method after ligation of the meso-appendix. No attempt was made to dislodge the adherent cecum from the sac, but the latter was closed with a continuous No. 0 chromic catgut suture, thus invaginating the sac. The transversalis fascia was then closed with interrupted No. 40 cotton sutures.

Figure 1. Electrocardiographic tracings: L1 shows complete inversion; L2 and L3 are transposed; 4F<sub>1</sub> with precordial electrode on the left, shows complete inversion; 4F<sub>2</sub> with precordial electrode on the right, over the actual apex, shows normal biphasic 4F tracing.

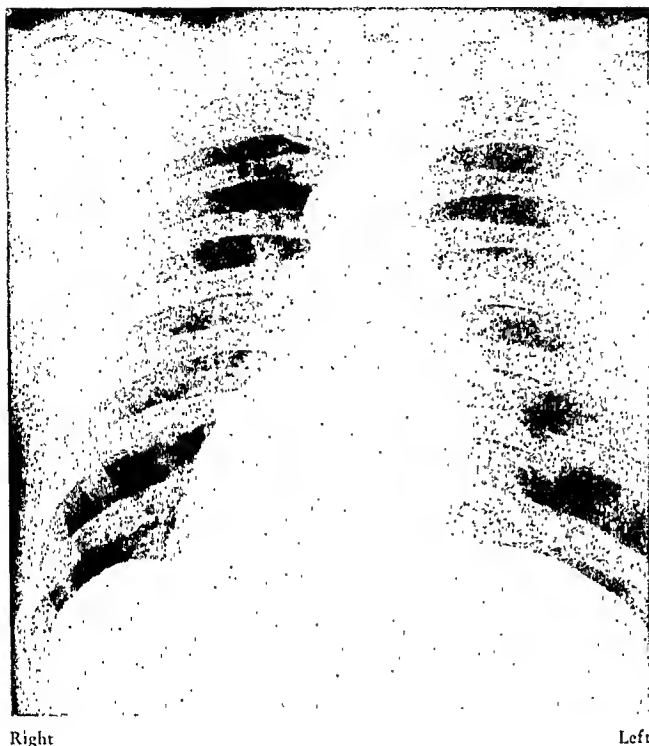


Figure 2. X-ray of chest, showing the heart on the right side.

Final repair was made by bringing together the conjoined tendon to the shelving margin of Poupart's ligament, taking small bites through the transversalis fascia. The external oblique aponeurosis was imbricated beneath the cord as in a modified Andrew's hernioplasty. Scarpa's fascia and the skin were closed with interrupted cotton suture. The occurrence of the cecum and the appendix on the left strongly suggested the possibility of a situs inversus.

ON THE morning of the first postoperative day, percussion and auscultation of the chest revealed without any doubt the presence

of a dextrocardia. On the second day the patient was permitted out of bed and allowed to take a few steps. He was placed on a full diet and by the third day was ambulatory.

On the fifth day, an electrocardiogram was taken, the tracing of which can be seen in Figure 1, which showed a complete reversal of a normal tracing. The conclusion of the cardiologist was that of a complete situs inversus. On the ninth day fluoroscopic examination of the chest further confirmed the fact of a dextrocardia, as did also the liver shadow on the left. X-rays taken after the ingestion of barium showed the cecum on the left and the





Right

Left

Figure 3. Barium enema, disclosing sigmoid on the right, cecum on the left.

sigmoid on the right. (See Figures 2, 3 & 4). No doubt now remained as to the presence of a complete situs inversus in this patient. The patient made a complete and uneventful recovery and was discharged from the hospital on the fourteenth postoperative day.

This case presents a man 43 years old, who spent one year in the Army, and whose induction and discharge examination records noted no physical abnormalities. In addition, he was hospitalized twice (1936 and 1939), when records of examinations before or after operation

mentioned no abnormality. In other words, three previous examinations failed to reveal the abnormality, and only when the pathology was brought out at operative table, was the true situation realized. Even though one might overlook dextrocardia on auscultation, such a case as his argues for more thorough examination before any operation. It should be stressed that when such a condition exists, the patient as well as the surgeon, and especially the latter, should know in case of any contemplated surgery.



Right

Left

Figure 4. Ingestion of barium to show stomach on the right.

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# Acute Pancreatitis

## MEDICAL AND SURGICAL MANAGEMENT

*A scientific exhibit from Thomas A. Shallow, M.D., Sherman A. Eger, M.D., and Frederick B. Wagner, Jr., M.D., of the Jefferson Medical College Hospital, Philadelphia.*

### INTRODUCTION

Until recently, acute pancreatitis has been considered to be of extreme rarity, difficult diagnosis, and high mortality. It is the purpose of this exhibit to emphasize the advances which have increased its recognition, rendered its diagnosis more certain, and greatly reduced its mortality. In addition, 50 consecutive cases encountered in the Jefferson Medical College Hospital during the past six years are analyzed, since they represent a typical group and illustrate well the associated lesions, the varying clinical manifestations, and the complications of this disease.

### INCIDENCE

#### AGE

1. Acute pancreatitis is usually a disease of middle and late life.
2. The average age for the 50 cases was 50 years.
3. The age extremes were 8 to 85 years.

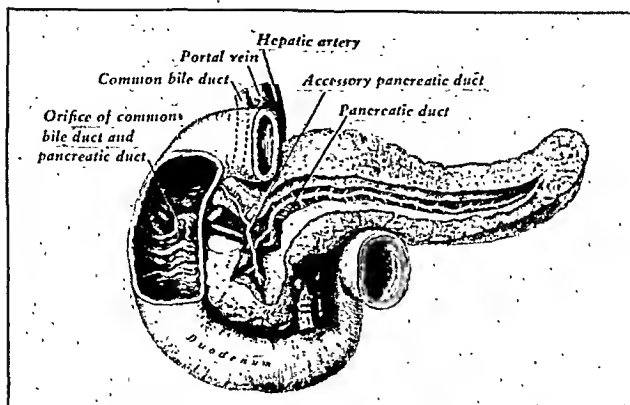
#### SEX

1. The disease is more common in females.
2. In the 50 cases 60 per cent were females and 40 per cent males.



#### COLOR

1. The disease is rare in the colored race.
2. Only one colored patient was encountered in the present series.



*The pancreas and its ducts (Gray).*

## ETIOLOGY

### I. Noninfectious Origin (Usual Primary Causes)

#### A. MECHANICAL OR OBSTRUCTIVE

1. Stone in common duct or ampulla of Vater
2. Stone in pancreatic duct
3. Spasm of sphincter of Oddi
4. Edematous occlusion of ampulla of Vater
5. Epithelial metaplasia in pancreatic duct

#### B. CHEMICAL

Activated pancreatic ferments resulting from

1. Reflux of bile
2. Reflux of duodenal contents
3. Autolysis

#### C. DEGENERATIVE CHANGES IN THE PANCREAS

1. Changes secondary to benign or malignant tumors
2. Changes from vascular degeneration or hemorrhage

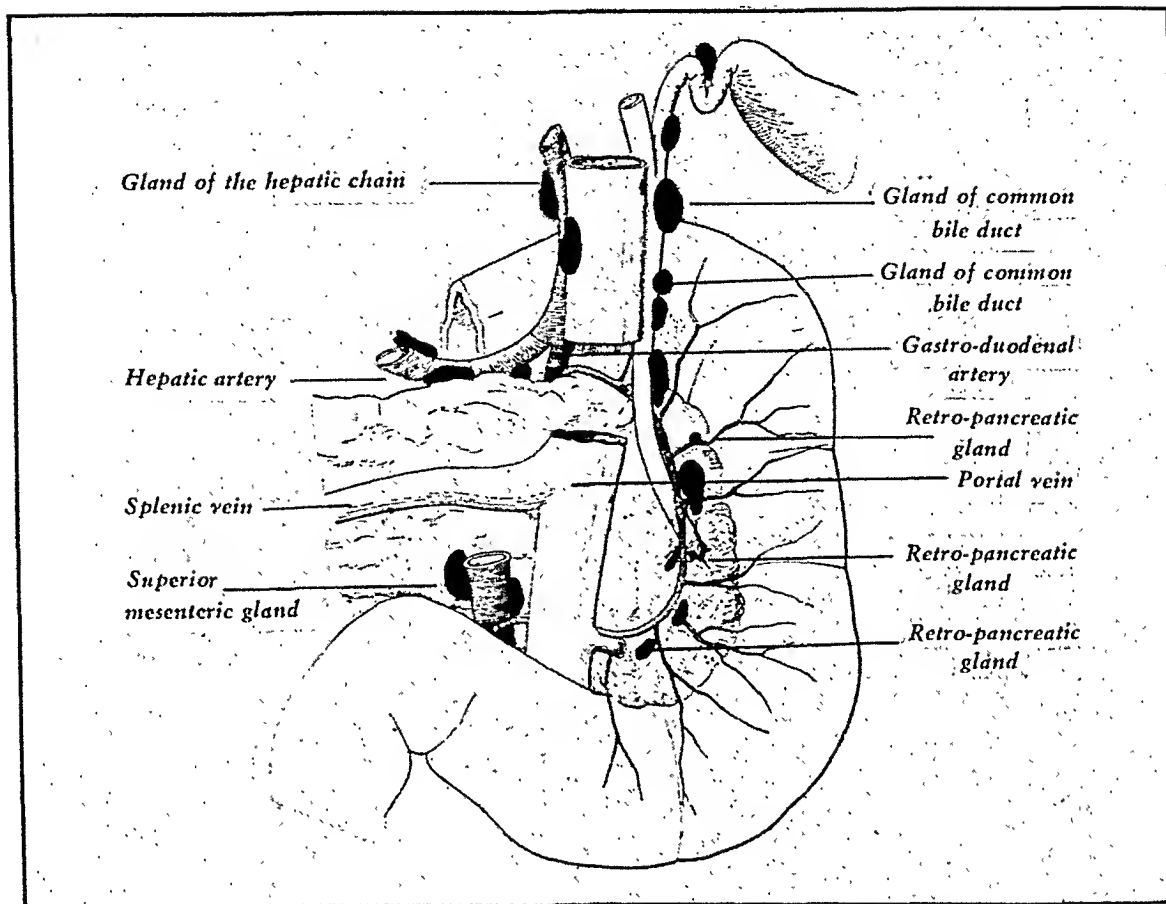
#### D. TRAUMA

1. Nonpenetrating abdominal injury
2. Penetrating abdominal injury
3. Surgical operative injury

### II. Infectious Origin (Usual Secondary Causes. Rarely Primary)

- A. Invasion of pancreas along the lymphatics
- B. Invasion of pancreas from the blood stream
- C. Infection by extension along pancreatic ducts from the duodenum or the bile ducts
- D. Infection by direct extension from adjacent infected foci
- E. Infection following activation of bacteria in the pancreas itself

### III. Combinations of Factors in I and II



*Posterior surface of duodenum and pancreas, showing relation of lymph nodes along the hepatic artery, cystic and common bile duct chains to those corresponding to the vascular arch behind the pancreas (Poirier, Cuneo, and Delamere).*

## PATHOLOGIC TYPES

### I. Edematous (Acute Interstitial Pancreatitis)

This is the common form and fortunately the milder.

*Grossly* the pancreas is swollen, hard, and contains small areas of fat necrosis.

*Microscopically* there is edema and many polymorphonuclear cells in the interstitial tissue of the acini and lobules.

Subsidence of the inflammation is accompanied by fibrosis.

### II. Hemorrhagic (Acute Pancreatic Necrosis)

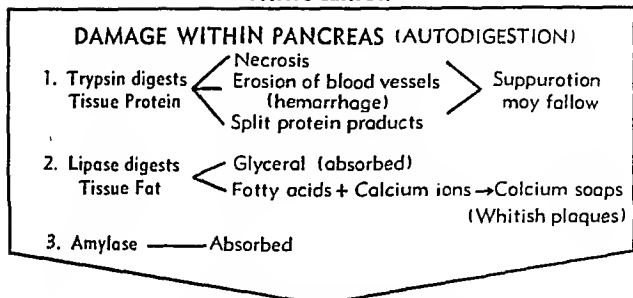
This is the less common but severe form.

*Grossly* the pancreas is enlarged, soft, and friable, and may be black and gangrenous. Areas of fat necrosis are abundant, found not only over the pancreas, but also in the mesentery, omentum, subperitoneal fat of the abdominal wall, and even in the mediastinum and pericardium (see illustration). There is blood tinged fluid in the peritoneal cavity.

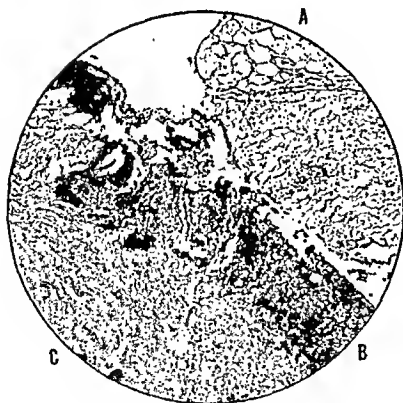
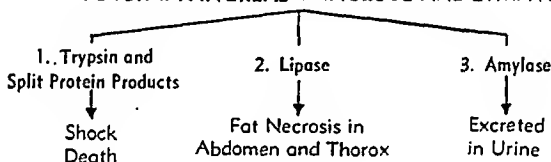
*Microscopically* within the pancreas there is a diffuse necrosis with extensive infiltration of polymorphonuclear cells. These necrotic areas may be absorbed and replaced by fibrous tissue or may become infected, resulting in abscess formation. Much of the pancreas may slough away.

Blood-tinged fluid and pancreatic enzymes in the lesser peritoneal cavity may become walled off by fibrous tissue, thus forming the so-called "pseudocyst."

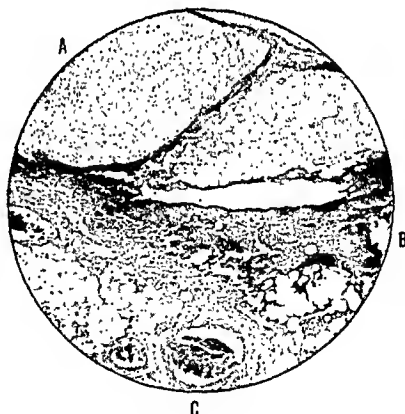
## PATHOGENESIS



## DAMAGE OUTSIDE PANCREAS (VIA BLOOD AND LYMPH STREAM)



Photomicrograph of slough of tail of pancreas, showing an island of fat necrosis (A); a dense zone of nuclear fragments, polymorphonuclear leukocytes and a few eosinophiles (B); and a zone of unidentifiable necrotic tissue (C).

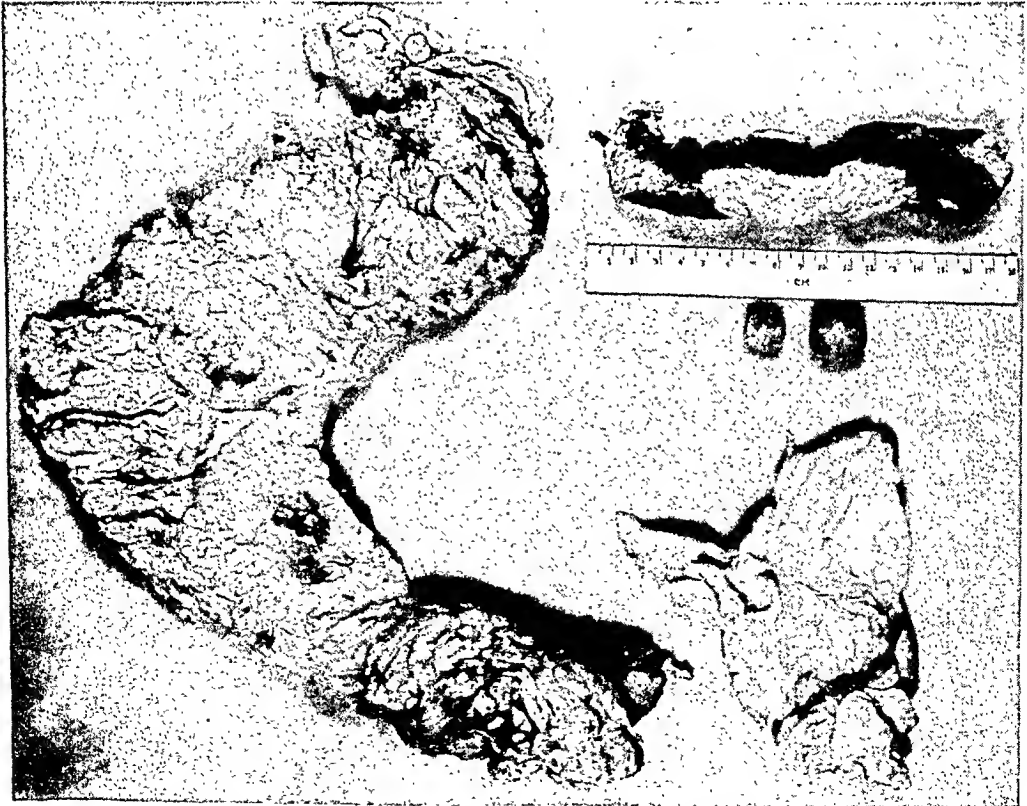


Photomicrograph of section of great omentum, showing extensive fat necrosis (A); a zone of polymorphonuclear leukocytes and nuclear fragments (B); and a zone containing dilated blood vessels (C).

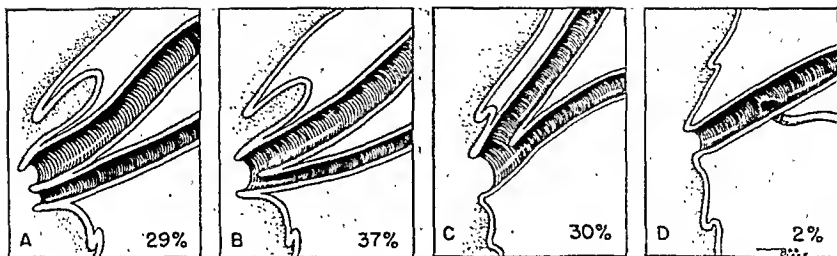
## SYMPTOMS AND SIGNS

The symptoms and signs of acute pancreatitis vary considerably, according to the degree of inflammation and the portion of gland involved.

1. EDEMATOUS TYPE (Common, Mild, Subsides within 24-48 Hours)
  - a. Pain, mild to moderate, usually epigastric, but may radiate to any portion of abdomen or lower chest.
  - b. Nausea and vomiting may occur.
  - c. Tenderness over pancreas.
  - d. Jaundice may occur from common duct obstruction or hepatitis.
  - e. Temperature and pulse rate moderately elevated.
2. HEMORRHAGIC TYPE (Uncommon, Severe, Duration 5-10 Days)
  - a. Pain, usually severe, with radiation to any portion of abdomen or lower chest.
  - b. Nausea and vomiting usually present.
  - c. Tenderness, rebound tenderness, and rigidity over pancreas and adjacent abdomen.
  - d. Distention due to toxic ileus.
  - e. Cyanosis and shock may occur.
  - f. Jaundice may result from common duct obstruction or hepatitis.
  - g. Temperature and pulse rate markedly elevated.



*Postmortem specimens, showing fat necrosis of omentum and pericardium, pancreatic hemorrhage, and two large gallstones.*



*Relational anatomy of the common bile and pancreatic ducts as they enter the duodenum (Rienhoff and Pickrell).*

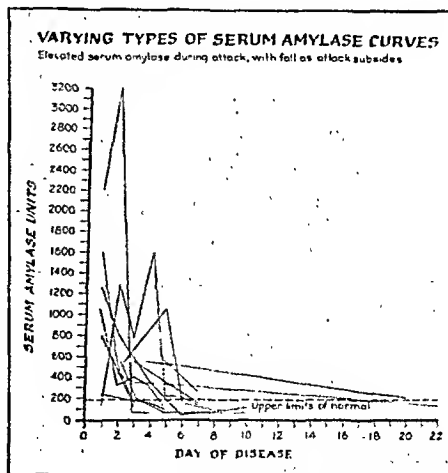
## DIAGNOSIS

1. Acute pancreatitis should be included as a diagnostic possibility in all patients with upper abdominal pain.
2. The diagnosis cannot be established with certainty from the symptoms and signs alone.
3. The serum amylase test confirms the diagnosis during the acute phase of the disease. This test is practically specific for acute pancreatitis and seldom, if ever, presents false positives.

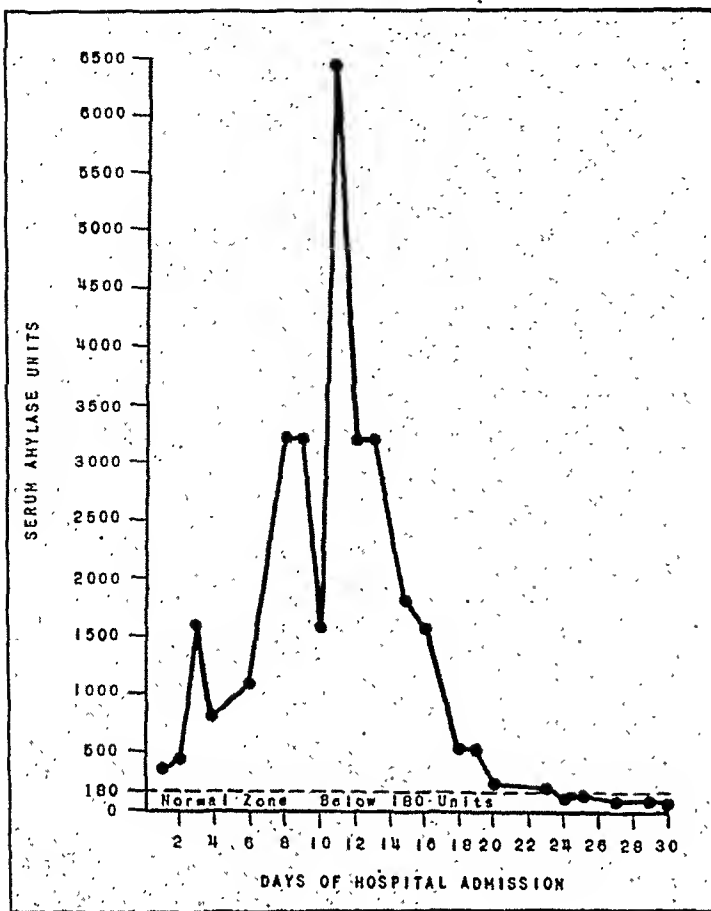
## DIFFERENTIAL DIAGNOSIS

Acute pancreatitis *must be differentiated from*

1. *Surgical Conditions*, such as
  - a. Ruptured Peptic Ulcer
  - b. Acute Cholecystitis
  - c. Acute Intestinal Obstruction
  - d. Biliary or Renal Colic
  - e. Appendicitis or Meckel's Diverticulitis
  - f. Mesenteric Thrombosis
2. *Medical Conditions*, such as
  - a. Coronary Artery Disease
  - b. Pneumonia
  - c. Tabetic Crisis







*Serum Amylase Readings in Unusual Case of Traumatic Pancreatitis: male; aged nine years; abdominal pain following non-penetrating trauma to upper abdomen; admission to hospital 9 days later when pain became acute; recovery without operation.*

## SERUM AMYLASE TEST

### I. Normal Variations

- Normally*, amylase is present in the blood stream at fairly constant levels. The origin of this amylase is at present unknown.
- Amylase in the blood* is completely absent at birth. It first appears at two months, is measurable at three months, and reaches the adult value at one year. Thereafter it is not influenced by age, sex, amount or type of food, fasting, dehydration, diuresis, exercise, or sleep.
- Among healthy ambulatory adults*, 80 per cent have levels between 80 and 150 units (Somogyi), while the remaining 20 per cent have a low range of 60 to 80 units or a high range of 150 to 180 units.

### II. Abnormal Variations

- Values above 200 units* or below 60 units are considered abnormal.
- Serum amylase activity rises sharply* at the onset of an attack of acute pancreatitis and may subside just as sharply within 48 to 72 hours. Levels as high as several thousand units are not unusual.
- Moderate or marked elevation* of the serum amylase rules strongly in favor of acute pancreatitis. A normal serum amylase report does not rule out acute pancreatitis.
- In doubtful cases* serial serum amylase determinations should be made at least daily. In all instances careful correlation of serum amylase values must be made with the history and physical findings.

- e. *Elevated serum amylase* may occur in conditions other than acute pancreatitis, such as acute parotitis, pneumonia, renal insufficiency, hyperthyroidism, and obstruction of abdominal venous or lymphatic return.
- f. *Decreased serum amylase* may occur in diseases associated with marked liver damage or debilitation, such as obstructive jaundice, pernicious anemia, diabetes mellitus and tuberculosis.

### III. Technic of Test

- a. 4 cc. starch solution (75 mg. starch and 250 mg. sodium chloride per 100 cc.) in test tube.
- b. Immerse in constant temperature water bath at 40° C.
- c. After several minutes add 1 cc. of patient's serum or plasma.
- d. Mix immediately. Time incubation from this point.
- e. After 5 to 6 minutes of incubation, 0.5 cc. portions of the mixture are withdrawn at intervals and introduced into test tubes (diameter 7 mm.) containing 0.5 cc. portions of the iodine solution (0.002 N. aqueous iodine solution containing 2 per cent potassium iodide). The test tubes are examined for color. The end point is the point at which red brown color of the erythrodextrin is seen with barely a perceptible tinge of purple. The exact time of incubation to produce this result is reported.

Calculations:

$$\text{Amylase equals } \frac{K}{V \times T}$$

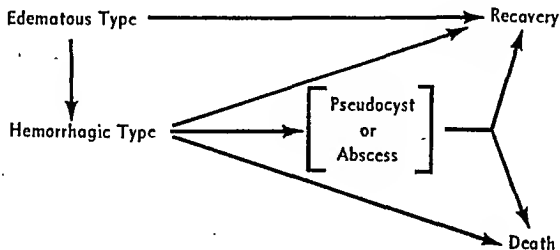
where  $K$  equals *constant factor* (1600)

$T$  equals *exact time of incubation* (min.)

$V$  equals *exact volume of serum used* (cc.)

When the amylase activity of the blood is abnormally high, as in acute pancreatitis, the color given with iodine will be far past the end point at the 5 minute test. In such instances the determination is repeated with diluted plasma. Dilutions of 1:2 to 1:15 may be necessary. For dilution of the serum 0.5 per cent sodium chloride is used. If a 1:4 dilution is used, and 1 cc. of this dilution is used in the test, then  $V$  equals 0.25, as actually only 0.25 cc. of serum is used.

### CLINICAL COURSE OF ACUTE PANCREATITIS



## LABORATORY FINDINGS OTHER THAN ELEVATED SERUM AMYLASE

### 1. Leukocytosis

Leukocytosis is usually present in acute pancreatitis, but is more marked in the hemorrhagic type (15,000-30,000). Early the serum amylase may be elevated before the leukocytic response occurs, whereas the leukocytosis may persist for several days after the serum amylase values have fallen to normal.

### 2. Albuminuria

This is present in varying degrees in practically all cases. It is probably due to an irritant effect of the circulating toxic products upon the renal glomerular membrane or the tubular epithelium.

### 3. Hyperbilirubinemia

Latent to manifest jaundice is frequently present. This is probably due in most instances to edema in the head of the pancreas with resultant compression of the common duct in its transit through the gland, but the presence of a stone in the common duct or associated hepatitis may play a role in some cases.

### 4. Hypoprothrombinemia

In the majority of cases the prothrombin time is 60% or less. This is probably due to associated liver damage, toxic in origin.

### 5. Bromsulfalein Dye Retention

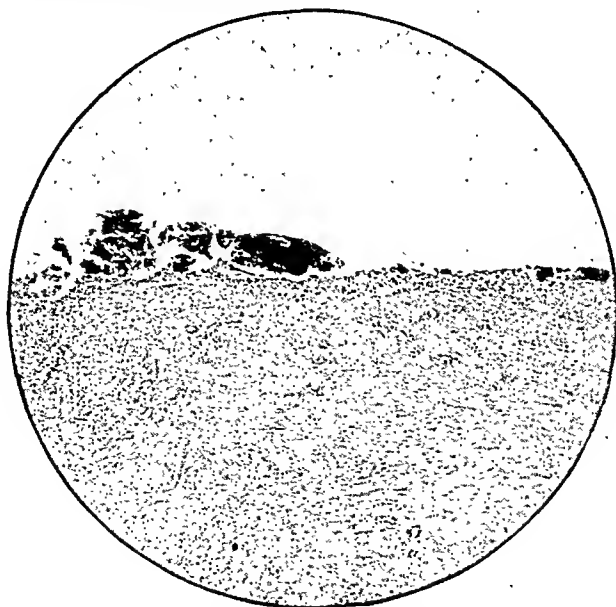
Mild degrees of dye retention, as shown by this liver function test, are further evidence of the associated liver damage, toxic in origin.

### 6. Hypoproteinemia

The serum protein level is more apt to be lowered in the hemorrhagic type. We advocate this as an important study in acute pancreatitis, since its correction is essential in tissue repair.

### 7. Hypocalcemia

According to the recent work of Edmondson and Berne, serum calcium findings below 9 mg. per 100 cc. of blood usually occur in cases of pancreatic necrosis some time between the 2nd and 15th day of the disease, and values below 7 mg. indicate a fatal prognosis.



*Photomicrograph of wall of pseudocyst, composed entirely of dense fibrous tissue. Note absence of lining membrane.*

## TREATMENT

Acute pancreatitis is not an operative emergency, but is primarily a medical problem. Operation is indicated later, if complications such as pseudocyst or abscess arise, or if there is a contributing lesion such as biliary tract disease.

### Medical Management

#### Rationale:

1. To lessen pancreatic activity.
2. To combat toxicity, infection, and shock.
3. To prevent or minimize complications.

#### Methods employed:

1. Withholding food by mouth, thus eliminating a stimulus to pancreatic secretion.
2. Wangensteen suction to combat ileus.
3. Intravenous administration of saline solution, glucose, blood, or plasma, amino acids, and vitamins (B complex, C, and K).
4. Chemotherapy (antibiotics and sulfonamides) to combat infection.
5. Oxygen in severe cases.

#### Results:

Within 48 hours the edematous type of pancreatitis usually subsides and the hemorrhagic type may improve. Failure to improve indicates the hemorrhagic type in which the development of pseudocyst or abscess should be strongly suspected.

### Surgical Management

#### Indications for Operation:

1. *During the acute attack*, when the patient becomes progressively worse, despite medical treatment. Here, undue delay may prove disastrous.

#### Rationale:

- (a) To permit drainage of products of pancreatic digestion, either infected or non-infected, from the lesser peritoneal cavity.
  - (b) To decompress the biliary system by cholecystostomy or choledochostomy when it is under increased tension, but more radical surgery such as cholecystectomy should be deferred to a later date.
2. *After the acute attack has subsided*, for correction of any contributing lesion which subsequent studies have revealed. Here, the procedure is elective.

#### Rationale:

- (a) To aid in preventing subsequent attacks of acute pancreatitis.
- (b) To correct the contributing lesion itself (usually biliary tract disease).

### Procedure When Patient Is Operated Upon Because of Mistaken Diagnosis

When acute pancreatitis is encountered unexpectedly at laparotomy, then the most conservative surgical procedure aimed at correction of some obvious etiologic factor, if one presents, as for example biliary tract disease, is the best. A drain inserted to the capsule of the pancreas through the gastrohepatic or gastrocolic omentum, and biliary drainage only when definite indication exists, usually suffices.

TREATMENT EMPLOYED IN EXHIBITORS' SERIES OF 50 CASES

Edematous Type (36 Cases)

Medical Treatment Only.....11

Operated Cases .....25

Operative Procedures:

(All were delayed until acute phase subsided)

Cholecystectomy .....18

    Alone ..... 8

    With Appendectomy .....3

    With T-Tube Drainage.....3

    With T-Tube Drainage and Appendectomy .....4

Cholecystostomy ..... 2

T-Tube Drainage Alone ..... 1

Cholecystojejunostomy ..... 4

Hemorrhagic Type (14 Cases)

Medical Treatment Only..... 4

Operated Cases .....10

Operative Procedures:

    Immediate Operations ..... 5

        (Performed during acute phase because of mistaken diagnosis for: Ruptured Peptic Ulcer, Acute Intestinal Obstruction, and Strangulated Epigastric Hernia.)

        Exploratory Laparotomy .....3

        Drainage of Lesser Peritoneal Cavity .....2

            Alone .....1

            With Cholecystostomy .....1

    Delayed Operations ..... 5

        Drainage of Pseudocyst .....2

            In Transverse Mesocolon.....1

            Between Stomach and Transverse Colon (Marsupialization) ....1

        Drainage of Pancreatic Abscess.....2

            With Cholecystostomy .....1

            With Drainage of Liver Abscess.1

        Exploratory Laparotomy .....1



*Cholangiogram in patient who had acute hemorrhagic pancreatitis, showing reflux of radiopaque medium into pancreatic duct.*



*Plain roentgenogram, showing toxic ileus in patient with acute hemorrhagic pancreatitis.*

**ASSOCIATED BILIARY TRACT DISEASE (68%)****In Edematous Type**

Present in 27 out of 36 cases (75%)

Acute Calculous Cholecystitis	5
Acute Non-Calculous Cholecystitis	1
Empyema with Calculi	1
Chronic Calculous Cholecystitis	6
Chronic Non-Calculous Cholecystitis	6
Hydrops with Calculi	2
Common Duct Stone	1
Diagnosis on History Alone	5

**In Hemorrhagic Type**

Present in 7 out of 14 cases (50%)

Acute Non-Calculous Cholecystitis	1
Chronic Non-Calculous Cholecystitis	1
Chronic Calculous Cholecystitis	1
Diagnosis on History Alone	4

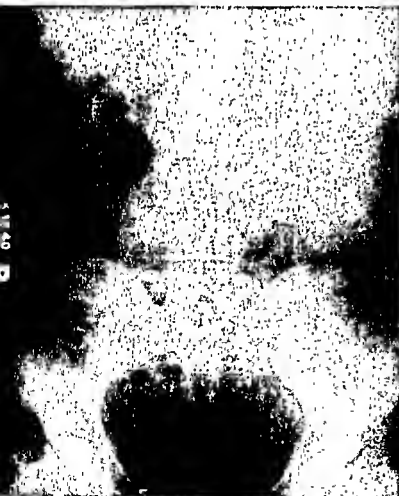
**OTHER ASSOCIATED DISEASES (12%)****In Edematous Type**

Present in 6 out of 36 cases (17%)

Carcinoma of Head of Pancreas	3
Perforating Posterior Peptic Ulcer	2
Duodenal Diverticulum	1

**In Hemorrhagic Type**

None



Plain roentgenogram, showing large soft tissue mass (pancreatic pseudocyst) in left upper abdominal quadrant.



Roentgenologic upper gastrointestinal study with barium, showing displacement of the stomach and extrinsic pressure on the greater curvature.



*Normal position and contour of stomach restored following marsupialization of pancreatic pseudocyst.*



*Postoperative barium enema, showing splenic flexure restored to normal position.*

## COMPLICATIONS

During a severe attack of acute pancreatitis, enzymes and products of pancreatic necrosis may accumulate within the lesser peritoneal cavity, and by their irritating effect become walled off by an inflammatory reaction, forming the so-called *pseudocyst*. *Abscess formation* results when bacteria infect the pancreas itself, or any accumulated fluid and tissue debris within the lesser peritoneal cavity, or even adjacent structures such as liver or mesentery.

<i>Complications Encountered in Exhibitors' Series Pseudocyst Formation</i>	4 Cases
Between Stomach and Liver	1
Between Stomach and Transverse Colon	1
In Transverse Mesocolon	1
Early Pseudocyst in Lesser Sac	1
<i>Abscess Formation</i>	2 Cases
Pancreas Alone	1
Pancreas and Liver	1

## MORTALITY

There were 3 deaths in this series (6 per cent).

Two patients had far advanced carcinoma of the pancreas with severe jaundice and edematous pancreatitis; they died following cholecystojejunostomy.

One patient had fulminating pancreatitis, became progressively worse, and died within one week without surgical intervention. Postmortem examination revealed acute hemorrhagic pancreatitis with early pseudocyst in the lesser sac; fat necrosis of visceral and parietal peritoneum, pericardium, and left pleura; and pulmonary edema.



*Preoperative barium enema, showing displacement of splenic flexure of colon to level of left iliac crest by pancreatic pseudocyst.*



*Pancreatic pseudocyst producing filling defect along lesser curvature of stomach.*

## CONCLUSIONS

1. The reliability of the serum amylase test in diagnosis during the acute phase of pancreatitis has become firmly established.
2. Whenever the diagnosis is questionable in a patient with acute upper abdominal pain, a serum amylase test should be performed.
3. Proper management of acute pancreatitis is dependent upon accurate diagnosis.
4. We believe that if the clinical picture of acute pancreatitis is substantiated by an elevated serum amylase, one is justified in delaying operation and in some cases not operating at all.
5. Delay in operating, with conservative measures directed toward combating toxicity, altered blood chemistry, and infection, has markedly decreased the mortality in acute pancreatitis.
6. Operation is indicated during the acute phase only if the patient becomes progressively worse despite supportive therapy. The surgical procedure employed should be as conservative as possible, consisting of drainage of the lesser peritoneal cavity, and, if necessary, decompression of the biliary tract.
7. Operation is indicated after acute phase, if it is necessary to correct contributing lesions, usually biliary tract disease.



# EDITORIALS

## CARCINOMA OF THE BREAST

THE June issue of *Annals of Surgery* included three interesting papers on carcinoma of the breast, which had been read at the 58th Annual Session of the Southern Surgical Association.

Finney and his associates discussed results of their operation on 298 consecutive patients, over a period of fifteen years. Four surgeons performed the operations, which included 281 radical mastectomies and 17 simple mastectomies. Only 19 received either pre- or post-operative radiation; hormonal therapy had been used in 3 of the group. Operative mortality was 1 per cent. After three years, the survival rate was 77 per cent; 49 per cent after five years; 19 per cent after ten years; and 4 per cent after fifteen years. One hundred-fifty of the group did not die of cancer metastases; of these, 70 per cent showed no metastatic lesions in their axillary nodes at the time of operation. The authors believe that for a good prognosis, radical operation must be done before metastasis has occurred in the axillary nodes.

A series of 238 patients was studied by Marshall and Hare, who found that radical surgical removal of breast carcinoma, followed by intensive radiation treatment, yielded improved clinical results and prolonged life. After five years or longer, 52 per cent of their patients were still alive, and showed no evidence of recurrent tumor. Further, local recurrent tumors appeared in only 8 per cent of their patients. Marshall and Hare agree with the previous authors, in stating that failures, in many cases at least, result from spread of the disease to distant areas, prior to beginning treatment.

Horsley, on the basis of sound rationale, combined radical amputation of the breast with bilateral oophorectomy, in premenopausal patients. While his series was small, consisting of only 26 patients who had been operated for three years or more, his results do appear remarkable. In both his three- and five-year post-operative groups 76.9 per cent of the patients were living and had suffered no recurrences. He compared these results with those obtained in 62 patients who had been operated, without oophorectomy, and who likewise had had no recurrences within five years. This latter group consisted of only 43.5 per cent of the operated patients. Hence, the author justly recommends the combined operative procedure.

## BIRTH, DEATH, AND LIFE SPAN

THE Statistical Bulletin of the Metropolitan Life Insurance Company predicts that more babies will be born this year, in the United States, than ever before. The 1947 number should exceed the 3,440,000 mark set last year, thereby establishing a new record. Forty per cent more babies were born during the first five months of 1947 than during the like period of 1946. As the year progresses, this large difference will be whittled down, but not enough to keep this year from being a record year. In addition, the statisticians believe that 1947 will hold the record for some years to come, because the marriage rate dropped appreciably during the first five months of the current year.

Another factor bearing upon this question, is the accelerated divorce rate in this country. The increase in the number of divorces granted

between 1942 and 1946 nearly equalled the increase from the beginning of our history until the year 1942.

While 1947 is the bumper year for babies, it will also probably set a record for longevity and low mortality. During the past decade the life expectation of American wage earners and their families has increased by five years; life expectation among this group is ten years greater now than in 1926. At present it has passed the sixty-five year mark.

A new low in mortality will doubtless be reached this year, barring some unforeseen development. Improvement in mortality is evident in virtually every age period. During the first six months of this year the rate was 7.6 per 1,000 Metropolitan policy holders, which is 3.8 per cent lower than that for a like period of 1946.

Fewer deaths are caused by infectious diseases such as pneumonia, tuberculosis, and syphilis. The principal communicable diseases of childhood have new minimum rates. Diabetes and cardiovascular-renal diseases have favorable rates this year. Cancer alone registers an increased mortality.

## HYDATIDIFORM MOLE

CONVENTIONAL laboratory tests for pregnancy have never successfully differentiated normal pregnancy from hydatidiform mole. This diagnostic failure often leads to serious complications. Consequently, the announcement of Weisman and Coates is of interest, for these investigators were able to differentiate the two conditions by a single quantitative assay of the gonadotropic hormone in the urine.

Their experimental animal was the South African "frog," *Xenopus laevis*, which, incidentally, is not a true frog at all, but merely resembles one. When the female of this species is injected with pregnancy urine, it lays eggs in abundance. If the patient's urine does not contain gonadotropic hormone, as in pregnancy, the frog lays no eggs.

Chorionic tumors (hydatidiform mole) are

usually associated with tremendous outpourings of gonadotropic hormone in the urine. Generally, in the patients with these tumors the amount of hormone found in the urine is as much as a hundred or even a thousand times as great as that found in a normal pregnancy. On the basis of this well-known fact, Weisman and Coates developed their test.

Frogs must be injected with undiluted, or even concentrated normal pregnancy urine in order for them to lay eggs. If normal pregnancy urine is diluted 1:10 it rarely if ever contains sufficient hormone to cause egg-laying response. But the urine of patients with hydatidiform mole contains such quantities of hormone that even in dilution of 1:100, the frogs can be made to lay eggs.

Three frogs, then, were injected with suspected urine, in undiluted strength, in dilution of 1:10, and in dilution of 1:100, respectively. If only the frog injected with undiluted urine laid eggs, normal pregnancy was implied. If the frog injected with urine diluted 1:10 also laid eggs, the probability of a tumor could not be dismissed. If all three frogs laid eggs, the presence of a far-advanced chorionic tumor was almost a certainty. Except in the very rare normal pregnancies in which tremendous amounts of hormone are excreted, this test will yield a valuable diagnosis.

Weisman and Coates tested 31 patients, 6 of whom were diagnosed as having chorionic tumors. Clinical studies substantiated the diagnoses. Of the remaining 25 patients who gave no response with diluted urines, 1 was found at laparotomy to have a large ovarian cyst; the remainder were normal pregnancies.

## RADIOACTIVE PHOSPHORUS

REGARDLESS of obvious and distinct clinical limitations, roentgen radiation has for years been the most effective palliative treatment of chronic leukemic states and allied hematologic dyscrasias. Radium and other naturally occurring radioactive elements also have been used, but, of necessity, applied externally.

With the development of the cyclotron, however, isotopes have been made available which permit internal radiation therapy. Of these, radioactive phosphorus,  $P^{32}$ , has received most extensive study. Doan and his associates at the Medical School of Ohio State University recently have published their results of a six-year clinical evaluation of  $P^{32}$  as a therapeutic agent in blood dyscrasias.

The therapeutic value of  $P^{32}$  is dependent upon the fact that phosphorus is selectively deposited in bone and in the nuclei of rapidly multiplying cells. However, the radioactive and the nonradioactive isotopes of phosphorus are chemically identical. Hence the radioactive material is so situated that the beta-rays may exert their maximum inhibitory and destructive effects upon adjacent marrow elements.

Diseases treated with  $P^{32}$  included polycythemia rubra vera, various leukemias, Hodgkin's syndrome, metastatic carcinoma and sarcoma, multiple myeloma, mycosis fungoides, and exfoliative dermatitis. Altogether, one hundred patients were included in the series.

Administration of the drug, in more recent months, has been confined to the oral route.

$P^{32}$  was found to be of greatest value in controlling the clinical and hematologic manifestations of polycythemia rubra vera. It has an adjunctive value in some chronic leukemic states, particularly in patients who are intolerant or resistant to roentgen radiation.

The acute leukemias, in general, do not respond favorably to  $P^{32}$  treatment; nor has the drug proven effective, and may even be dangerous, in Hodgkin's syndrome. Although metastatic malignancies of the bone may or may not be specifically retarded, the deep bone pain may be relieved by  $P^{32}$ . In some cases pruritis secondary to leukemia cutis, polycythemia rubra vera, and exfoliative dermatitis has been effectively controlled.

Doan and his associates emphasize that the efficacy of therapy depends upon "selective" cell destruction. Doses of  $P^{32}$  should be well-spaced, small, and adequately controlled with frequent and complete blood and bone marrow studies.

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# This Month in Medicine

## SEROLOGIC SYPHILIS REACTIONS

PERSISTENT non-specific, false-positive reactions to serologic tests for syphilis are always confusing, and have elicited numerous explanations. At least one investigator has suggested that there might be such a thing as hereditary false-positive reactivity, determined by gene action and transmitted from parent to offspring in much the same manner as the blood groups. This, indeed, appears to be the finding of Singer and Boerner, who studied an Italian family, most of whose members consistently gave false-positive flocculation tests when tested for syphilis.

Most false-positive reactions disappear after a few days or weeks, for frequently they are engendered by inflammatory processes, immunizations, etc. In the case of this family, however, false-positive reactions have endured for a space of two years, although none of the family gives any history or evidence of syphilis. Complement fixation reactions are consistently negative.

The father's serum is negative to the flocculation test for syphilis. The mother's serum is positive. Sera of three of the children are positive; serum of the fourth child, Jean, is negative. The father is blood group O, and the mother is group A. The three children who give positive flocculation tests are group A, while Jean, the flocculation-negative reactor, is group O.

These data, admittedly very scanty, suggest that the factor that determines non-specific reactivity of the serum might be hereditary and transmitted in the same way as the blood groups; indeed, in this case, it might be carried on the same chromosome as the gene for blood group A. Many more data, of course, are essential.

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Singer, A. G., and Boerner, F.: Persistent familial (non-specific) serologic flocculation reactions for syphilis suggesting an hereditary mechanism. *Am. J. M. Sc.* 214:89 (July) 1947.

## BAL AND ARSENICAL DERMATITIS

BAL (British Anti-Lewisite) has been referred to as the answer to the syphilologist's prayer. Well it might be, for through the judicious use of this compound, syphilitics may now be relieved of their arsenical dermatitis in a matter of a few days. They may be treated as out-patients. No longer need they be confined to the hospital for weeks at a time.

Reeve recently reported his successful treatment of two patients suffering from erythematous rashes with desquamation, which had been brought on by arsenical administration. The conventional treatments brought no relief. BAL therapy was then started: 2 ml. was introduced intramuscularly every four hours, the first day; followed by 2 ml. twice a day for three days; then 2 ml. a day for two days. Response was dramatic. The rash began to clear as soon as treatment was started.

### SUGGESTED READING

Reeve, J. L.: Arsenical dermatitis successfully treated with BAL. *Brit. M. J.* 2:132 (July 26) 1947.

## BLOOD-BANKS AND SYPHILIS

ONE of the more important precautionary problems involved in a blood-bank program is the prevention of transfusion syphilis. Numerous investigations have been conducted to determine the virulence of *Treponema pallidum* under conditions which obtain in blood-banks and in processed blood products.

Turner and his associates have been most assiduous students of the problems involved, and their general conclusion has been that desiccated blood serum or plasma may be transfused with probably no risk to the recipient, even though the donor had syphilis. However, Turner and his group based their conclusions on a ninety-day ob-

servation period following the injection of rabbits with reconstituted dried plasma derived from syphilitics. Consequently, their experiments recently have been repeated by Probey of the U.S.P.H.S., with the view to extending the period of observation and to gain further data as well.

Probey observed that rabbits which were inoculated with restored dried material did not develop evidence of syphilitic infection during approximately one-hundred-forty days' observation. Three successive sub-transfers, observed for thirteen, seven, and nine months, respectively, also remained negative. Consequently, he concludes that *Treponema pallidum* apparently is killed during the deep-freezing and drying process. Processed (frozen and dried) human plasma or serum containing not more than one per cent moisture may be used with impunity.

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Turner, T. B., Bauer, J. H., and Kluth, F. D.: The viability of the spirochetes of syphilis and yaws in desiccated blood serum. Am. J. M. Sc. 202:416, 1941.

Probey, T. F.: Loss of virulence of *Treponema pallidum* during processing of dried blood plasma. Pub. Health Rep. 62:1199 (August 15) 1947.

### POLIOMYELITIS VIRUS

THE incidence of water-borne poliomyelitis may be greatly reduced by adequate and proper chlorination. Various investigators have found that poliomyelitis virus is readily inactivated with small quantities of either free chlorine or chloramine. Recently, Lensen and his associates have studied the effect of pH on the viricidal power of these agents.

In water with a pH of 6.85-7.40 the poliomyelitis virus was inactivated within ten minutes, in the presence of as little as 0.05 p.p.m. of free chlorine.

When the pH range is raised to 8.95-9.25, the free chlorine residuals are less effective in inactivating the virus. In some experiments the virus was not inactivated even within an hour. However, when the viricidal agent is residual chloramine, without free chlorine, the pH of the water is of no apparent importance. Residual chloramine values of 0.5-0.75 p.p.m. usually inactivate the virus within two hours; values of 0.2 p.p.m. or less are not viricidal.

#### SUGGESTED READING

Lensen, S. G., et al.: Inactivation of partially purified poliomyelitis virus in water by chlorination, II. Am. J. Pub. Health 37:869 (July) 1947.

### TELEVISION

THERE is no reason why television, like motion pictures, should not become a most important aid in medical teaching. Ruedemann, of the Cleveland Clinic, has reported his experience with this new technic.

In collaboration with the Chief of Education for the Navy and television technicians of Paramount Studios, Ruedemann developed a television set-up which televised, with amazing clarity, various surgical procedures. The apparatus was equipped with a loud-speaker, so that a running commentary of the operation could be given while the observers watched the television screen.

Use was made of a variety of lenses. The operators showed the general operative field, then switched to the telephoto lens for detail. Various filters gave striking contrast. All in all, Ruedemann believes the surgical amphitheater is doomed, for television enables the observer to see more and better than he has ever been able to before.

#### SUGGESTED READING

Ruedemann, A. D.: The use of television in medicine. Cleveland Clin. Quart. 14:145 (July) 1947.

R.V.C.

# Consultation Service

This special consultation information service is offered as a regular monthly feature of *Postgraduate Medicine*. Readers are invited to call on this Service for answers to difficult medical problems from members of our Editorial Board best qualified to help. Each question will be answered by mail and those of general interest will be published each month. Address all communications to Consultation Service, *Postgraduate Medicine*, 512 Essex Building, Minneapolis 2, Minnesota.

## ACID PHOSPHATASE IN DIAGNOSIS OF PROSTATIC CANCER

**QUESTION:** *What is the physiologic function of acid and alkaline phosphatase? Is an elevated acid phosphatase diagnostic of metastatic carcinoma of the prostate?* M.D.—Wisconsin

**ANSWER:** Phosphatase: an enzyme capable of hydrolyzing the phosphoric esters of erythrocytes and plasma derived from hexosephosphate, glycerophosphate and nucleoprotein with the liberation of phosphate. This material occurs in nearly all of the tissues of the body. The largest amounts are found in the bones and teeth during infancy and childhood.

Phosphatase found in erythrocytes is apparently different from that found in the tissues, plasma, and leucocytes so that probably two phosphatases exist. Under physiological conditions serum phosphatase is not only increased in teeth and bone development in infancy but during the healing of fracture, during alimentary hyperglycemia, pregnancy, following exposure to ultraviolet light and after the administration of ergosterol.

Some observers believe that phosphatase is synthesized by the osteoblast of bone.

Normal prostatic tissue is rich in phosphatase with optimum activity of a pH of 4.9. Phosphatase is also found in carcinomatous prostate gland tissue and at the site of the skeletal metastasis from this condition in the serum of these patients. In these bony metastases the ordinary or alkaline phosphatase may be raised as it is in osteitis deformans, but in the latter the acid phosphatase value is within the normal limit.

Estimation of the acid phosphatase concentration in the serum is a useful supplement to the clinical and radiologic examination of patients with carcinoma of the prostate gland. Increased values

of acid phosphatase may be the first and only indication of prostatic carcinomatous metastasis to bone or locally. (Refer to books on *Clinical Diagnosis by Laboratory Examination* by Kolmer and others.)

It is this prostate phosphatase which is believed responsible for the gigantic rise in the blood serum and is due to the dissemination of the malignant epithelium outside the boundary of the gland and into the blood stream. Conversely while a carcinoma remains localized and within the capsule there is no elevation of the acid phosphatase, although Robinson and Gutman state that small elevations may occur in non-prostatic bone disease. A study of Barringer's reports in the *Trans: G. U. Surgeons* indicated that carcinoma with metastasis to bone or distant soft tissues may not show elevations. This may be due to a deficiency of the enzyme, or the peculiarity of the tumor or its blood supply. When it is elevated it is specific in the height of its elevation. This may be used as an indication of therapy effect after orchidectomy. Within forty-eight hours there is a drop and it may continue to recede to normal. After estrogenic suppression the fall is slower. A rising return toward the original figures indicates recurrence of activity and metastasis.

Metastasis to bone usually produces higher serum acid phosphatase than does metastasis to soft tissues. (Woodward and Dean).

Both Barringer and Dean state that the serum alkaline phosphatase following estrogenic or castration therapy may increase. This is due to the healing of the bone lesions or an increase in the osteoplastic metastasis or possibly a sex hormone effect on bone development (Keto-steroid metabolism). It is agreed that with the rise of serum alkaline phosphatase there is no clinical correlation between it and x-ray or clinical response.

It is interesting to note that tumors of the blad-

der, rectum, and prostate may be differentiated by the serum acid phosphatase levels or by removing a biopsy section for acid phosphatase determination. It is almost specific for prostatic malignancy (carcinoma) to show a much higher content than other sources. Malignant tumors that may metastasize to the prostate will still not show the very marked elevation in acid phosphatase.

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 Woodward and Dean: J. Urol. 57:158, January 1942.  
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## CESAREAN SECTION

*QUESTION: I would like to ask your Consultation Service: 1. Their feeling on "once a cesarean always a cesarean." 2. Instead of doing a postpartum sterilization abdominally, why not do cesarean and tubal ligation thereby saving the patient the expense and discomfort of two procedures instead of one, in spite of the slight additional risk connected with the cesarean?*

*M.D.—California*

ANSWERS: 1. Like all rules the notion of "once a cesarean, always a cesarean" has some exceptions, but once a woman has had a cesarean section before delivery through the pelvis, most obstetricians feel that it is better to repeat the cesarean section, because of the risk of rupturing the uterus. While this risk is probably less than 4 per cent, such a serious accident if it occurs carries a mortality rate from 12 per cent to 40 per cent depending on the circumstances. If a cesarean is done because of disproportion, it should be repeated even though pelvic delivery has taken place in the past.

2. The answer to this question is perhaps explained in the last portion of the question; namely, that "there is a slight additional maternal risk." Abdominal delivery, while much safer than formerly, will perhaps never be as safe as a normal delivery through the pelvis. Those who report the use of early puerperal abdominal tubal sterilization

seem fairly satisfied with their results, and such a procedure minimizes hospitalization and other expenses and is occasionally applicable.

## FLUORINE IN PREVENTION OF CARIES

*QUESTION: Would you recommend the use of fluorine to prevent caries? If so at what age? In what way is it best administered topically? What is the explanation of its action in the prophylactic application?*  
*M.D.—Illinois*

ANSWERS: From epidemiological studies of children aged 12 to 14 and from animal studies in which comparatively large amounts of fluorine can be administered, a body of evidence has been accumulated which, beyond doubt, connects an optimal amount of fluorine in the drinking water with reduction in incidence of caries. The use of fluorine as a therapeutic agent is still in the experimental stages.

The body of evidence suggests that the first 10 years of life are the most valuable ones in which to administer fluorine if benefit in caries reduction is to be obtained. Some protection may possibly be obtained in later years.

Topically, the method we have used here is to clean and dry teeth, dip wisps of cotton in 1 or 2 per cent NaF solution in water, wipe the teeth with the cotton—one quadrant of the jaw at a time—protecting the rest of the mouth by cotton rolls. The period required for a complete treatment as we do it is 20 to 40 minutes. At the present time, we are giving children four treatments one week apart and repeating it at six-month intervals. There is no evidence that this is the best procedure.

The explanation of its action is not understood. A few factors which may be involved can be listed:

1. Fluorine is rapidly removed from solutions in contact with tooth surfaces and firmly bound to the tooth surfaces.

2. The solubility of such fluoride-treated tissues is considerably lower than that of untreated tooth tissues.

3. Production of oral organisms is reduced by fluoride.

4. Fluorides inhibit certain enzymes important in the metabolism of glucose.

# MEN OF MEDICINE

## FAMILY TEAMWORK IN KANSAS

THE Menningers brought Freud to the plains of Kansas and made Topeka one of the world's great psychiatric centers. The Menningers in Topeka are Dr. Karl and Dr. Will. The Menninger Clinic was developed by the sons of a pioneer country doctor, and represents the triumph of a modern therapeutic ideal: teamwork in the practice of psychiatry.

The Menninger Clinic has been the initial force in making a psychiatric mecca of Topeka. On the other side of town, Karl Menninger, with the help of the clinic staff, is molding the army's former Winter General Hospital into a model psychiatric center that is the pride of the Veterans Administration. Dr. Will serves as general director of the Menninger Foundation, a post he assumed in August 1946, when he laid aside his brigadier-general's uniform as wartime chief of the Army Medical Corps psychiatric division.

The Menningers today represent a most famous brother team in American psychiatry. Both have served as president of the American Psychoanalytical Association. Last May, Dr. William C. Menninger was elected to the presidency of the American Psychiatric Association, while Dr. Karl A. Menninger headed the reorganization committee which brought about the highest reform of the past half century.

Psychiatrists, nurses, social workers, research scientists, occupational therapists, and other members participate on an equal plane in periodic staff conferences. Professional jealousies and resentments that poison the atmosphere of many another mental hospital are rarely in evidence. The ideal of group practice is fully realized—the pooling of skills, knowledge, and technics toward a common goal: optimum improvement of the patient in the shortest possible time.

The Menningers and their associates conceive the

mental hospital as a "therapeutic community," not as an institution. The day's activities for both patients and staff are "socialized" to the closest possible approximation of everyday "normal" living. Patients, doctors, and employes mingle, so that it is often difficult for the casual visitor to tell which is which as he makes the rounds of the sanatorium.

Even visiting relatives, instead of getting the usual hrushoff, are coached on how to make their visits most helpful, what kind of letters to send, and how they can best aid in readjusting the patient to home life when he returns.

Patients are brought together in group play and group discussions, where they gather strength and self-knowledge through talking out their problems.

The Menninger Clinic is dominated by no psychiatric cult, nor on the other hand, is it characterized by any vague philosophies and opportunistic technics. The staff, generally, follows Freudian psychoanalysis. But Freud, in Topeka, is respected as a great scientific pioneer, not worshipped as a medical Moses or Mahomet; his writings blazed trails but are not holy writ; his system is accepted as a science, not a religion. A stream of celebrated leaders in psychiatry, representing many schools of thought and treatment, flows through Topeka, keeping the staff current on the latest trends in the theory and practice of their craft. This cross current of ideas prevents stagnation.

The Menningers themselves are Freudian-oriented eclectics. They have avoided the rigid sectarianism that has divided many of Freud's disciples into camps of warring, intolerant doctrinaires.

Sanatorium patients are charged \$650 a month for treatment—a stiff tariff. The Menningers are sometimes criticized for this high rate; the truth is that patients' fees have never amounted to enough to put the place in the black.

The high rate goes strictly into psychiatric treatment, not into luxurious accoutrements. The staff

Condensed from *Survey Graphic*, September 1947.





KARL A. MENNINGER, M.D.

tells you the place is a hospital, not a country club. Patients aren't coddled, the surroundings and the fare are plain. There is no amusement for amusement's sake; recreation is integrated into a therapy program. The Menninger Sanatorium is not a "rest home." Dr. Karl, at a recent meeting of the American Medical Association, lashed out severely at the "abuse of rest" in treating psychiatric cases, blasting the celebrated "rest cure" for neuroses and citing proof that prolonged rest often did more harm than good to tensed-up patients with unsolved emotional problems.

The sanatorium has room for only fifty-five patients, an infinitesimal fraction of the millions who need treatment. But the enterprise has national significance for two special reasons: it is a focal point for training psychiatrists in the face of an appalling shortage (there are less than 4,000 of these specialists in a country which desperately needs a minimum of 20,000); and it is a vital research center to help dispel the vast mystery that still hangs over the field of mental disorder.

**M**ENNINGER Clinic is the name loosely applied to a group of enterprises that make up a compact psychiatric center operated on a nonprofit basis by the Menninger Foundation. There is the clinic proper, which gives psychiatric services to mental and nervous patients who live off the grounds. There is the sanatorium, comprised of several reconverted dwelling houses.

The Menninger School of Psychiatric Training is developing doctors in the psychiatric specialty. There is training for psychologists and social workers, conducted in part in cooperation with nearby Kansas University at Lawrence. And the affiliated Southard South, named for the Harvard psychiatrist who gave Dr. Karl his early training, is a year-round boarding school for problem children of normal or superior intelligence.

Menninger doctors also staff Topeka's municipal mental hygiene clinic, giving out-patient service to emotionally disordered Topekans who can't afford private treatment. I attended one of these clinic sessions with Dr. Harlan Crank of the Menninger staff. Among the run-of-the mill cases that day were these:

A thirteen-year-old boy who reacted to his emotionally disturbed mother's obvious attitude of rejection and hostility by chronic bed-wetting and unruly behavior at home and school.

A middle-aged ex-dweller of a house of ill-fame who had developed paresis, a frequent end result of untreated or poorly treated syphilis.

A three-year-old who was mute and mentally backward although there was no apparent organic cause of either condition. Investigation had revealed that a too doting mother had smothered the child's initiative by anticipating every desire without giving him a chance to learn to ask for things.

There is a close tie-up between the Menninger Foundation and the Winter Veterans Hospital, which Dr. Karl has managed since January 1946. He accepted the post on the challenge of Veterans Administrator Omar Bradley and his medical aide, Major General Paul R. Hawley, to take over this abandoned army hospital, and transform it into a model center for mental and nervous disorders. There are now 1,200 patients, all veterans, most of them neuropsychiatric cases, with a sprinkling of general medical and surgical cases.

Also, some 125 young doctors, veterans themselves, are becoming specialists in psychiatry at Winter. They work under the faculty of the Menninger School of Psychiatric Training, supervised by Dr. Karl. The significance of this enterprise may be gauged by the fact that the 125 Winter residents in training represent half the total being trained in the entire VA program, and a third of the number being trained in all American medical institutions.

Winter Veterans Hospital is governed by the "total push" approach. Every detail is aimed at speeding recovery; every form of modern treatment is utilized—electric and insulin shock, sodium pentothal, hypnosis, occupational therapy, drama therapy, and so on. Underlying all treatment, however, is the basic idea of psychotherapy—stressing the psychological over chemical or mechanical methods of treatment.

The re-socializing process implicit in the "therapeutic community" plan is advanced by developing teamwork among the patients. Wards form basketball, softball, and table-tennis teams. Ward teams compete in carefully scheduled games: uneven contests are avoided to prevent loss of self-esteem by the losing team and the ward it represents. Self-government is stimulated by having the patients elect ward committees to promote orderly behavior and transmit ward gripes to the authorities.

**B**ACK in 1908, Dr. Charles F. Menninger, a Topeka physician with an insatiable yearning for fresh knowledge, journeyed to Rochester to see at first hand what the growing Mayo Clinic was all about. He talked to Dr. Charlie and Dr. Will and to their father, a surgeon, who had started his sons' way to group practice. He spent a week and returned, a convert to the group teamwork idea.

At home again, he told his wife, Flora, and his two sons that medical knowledge had become too complex for any individual to master satisfactorily, and that the way of modern medicine was by groups or teams where skills, techniques, and equipment could be pooled under one roof.

He calmly announced he was going to start a group practice clinic in Topeka. But his confreres turned a cold shoulder to his evangelism, so he



C. F. MENNINGER, M.D.

patiently waited for his sons to grow up. Karl, born in 1893, got his M.D. at Harvard in 1917, was a navy lieutenant during World War I, returned for postgraduate study, became a protégé of the psychiatric genius, Professor Ernest E. Southard and went back to Topeka where he and his father started the Menninger Clinic in 1923. When Brother Will, born in 1899, took his medical degree at Cornell in 1925, he made the team a trio.

The Menninger Clinic, treating mental cases on an out-patient basis, with the patients living off the grounds, steadily expanded. Through the years, this practice turned Topeka into one of the most psychiatry-conscious communities in the land.

World War II separated the Menningers, and marked a new turn in their careers. Dr. Will went into the army and rose to be chief of the Medical Corps Neuropsychiatric Division. Dr. Karl stayed in Topeka, holding together the Menninger enterprises and needling the country on the critical need for training psychiatric personnel to meet the inevitable acute postwar shortage.

THE brothers were reunited last August as a working team. The tall sons of old Doctor Menninger fit together like carpenter's mortise and tenon joint. Contrasting sharply in personality, they are almost the perfect foils for each other.

Dr. Karl is restless and excitable, often explosive and epigrammatic in conversation, throwing out sparks. Psychiatrists who delight in diagnosis might call him an extrovert manic type. He is one of the can't-sit kind, pacing the floor and punctuating his cascading words with sweeping gestures of his cigarette-holding hand. The gruff mannerisms and bluff talk cause many a casual acquaintance to miss the exceedingly sensitive heart beneath the defensive armor.

Karl Menninger is an idea man, a sparkplug, a promoter. Often, during a hot parlor discussion he will cut in: "All right, we've done a lot of talking about this. Now what are we going to DO about it?"

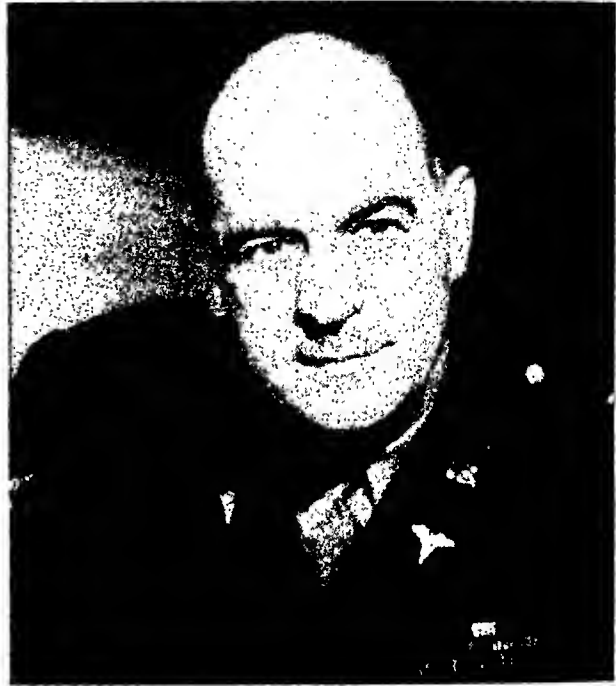
Like as not, his friends will hold up their hands in mock horror: "Please, Karl, don't organize us AGAIN!"

Dr. Will is more cautious in statement, less ebullient, far gentler in approach, sometimes almost shy. His modesty is unaffected and disarming. He has a knack of breaking down suspicion and jealousy in a profession peculiarly replete with hostilities.

When he was appointed neuropsychiatric chief of the army, many skeptics prophesied that chaos would ensue. Orthodox military psychiatrists would never follow an avowed Freudian, and Menninger would be too soft to stand the gaff of line officers prepared to scuttle any reforms he'd attempt. General Menninger overcame the obstacles amazingly. His men gained the grudging respect of the regulars, and the army's archaic system of dealing with mental disorder was drastically modernized and revised.

Dr. Will has just completed a book on military psychiatry in World War II. Dr. Karl already is the author of several popular psychiatric works, including "Love Against Hate," "Man Against Himself," and "The Human Mind."

Karl and Will Menninger lead rich private lives. Both are happily married. Both diligently pursue their hobbies. Dr. Karl is a chess enthusiast, and



WILLIAM C. MENNINGER, M.D.

likes to wind up the day's work with a game. He acquired from his father a deep love for the soil, and is a board member of the society called The Friends of the Land.

The latest organizing achievement of the dynamic Menningers may prove ultimately to be their most important. At the 1946 annual meeting of the American Psychiatric Association in Chicago, they led a group of so-called Young Turks, consisting mainly of war veterans and including many notables, in the informal organization of the Group for the Advancement of Psychiatry, abbreviated to GAP. A major motivating force was dissatisfaction with the slowness with which organized psychiatry had responded to the emergency demands of the war and postwar periods.

Meanwhile, from their home base in Topeka, the Menningers radiate a fundamental philosophy—a mixture of grass-roots democracy and the Freudian faith in love as the effective weapon against the destructive forces of hate and fear.

# What Other Editors Think

## Editorial Evaluations of Current Contributions To Medical Progress

### PREVENTION OF RENAL COMPLICATIONS BY THE USE OF SULFONAMIDE MIXTURES

AMONG the most frequent of the serious complications attending the use of the more effective sulfonamide compounds are those involving the urinary tract. These are caused predominantly by mechanical factors associated with the precipitation of crystals of the free or acetylated drugs anywhere along the urinary tract, and they are most serious when the precipitation occurs within the kidney tubules. These complications are dependent, in turn, largely on the solubility and the concentration of the compounds in the urine. Any measures that increase their solubility or prevent their excessive concentrations in the urine should therefore diminish the frequency with which precipitation occurs and hence reduce the incidence of renal complications.

These considerations have led to attempts to utilize mixtures of different sulfonamides.

Lehr used sulfathiazole and sulfadiazine in equal amounts and showed experimentally that this combination produces a low renal toxicity and has a high antibacterial activity. Clinical studies in patients with acute bacterial infection in both adults and children indicated that this mixture, given in the total doses ordinarily employed with single compounds, yielded uniformly satisfactory therapeutic results. Effective blood levels and high sulfonamide concentrations in the urine were readily maintained with these doses. When treatment was stopped, the mixtures were rapidly cleared from the body. Crystalluria was infrequent despite the intentional omission of adjuvant alkali therapy, and no signs of renal irritation were encountered. The incidence of allergic reactions, moreover, also appeared to be lowered.

Extensive studies with sulfonamide mixtures ("sulfa-combinations") have also been carried out by Frisk and his co-workers in Stockholm. They

found that the antibacterial effect of such a combination was equal to the sum of those of the individual components.

The most suitable composition per gram was found experimentally to be 0.37 gm. of sulfathiazole, 0.37 gm. of sulfadiazine and 0.26 gm. of sulfamerazine. This mixture had almost the same absorption and excretion relations as sulfadiazine. There was practically no risk from accumulation in the blood, even when high doses were administered. In the doses ordinarily used in the treatment of pneumonia, the combined preparation is not excreted in supersaturated solutions if the reaction of the urine is approximately neutral. With the individual components given in equal doses, on the other hand, either the free or acetylated form always occurs in the urine in supersaturated solution, even in a neutral urine. The Swedish workers thought that the use of this mixture appeared to eliminate the risk of the formation of concretions in normal kidneys. As added precautionary measures, however, they state that diuresis should be maintained and that alkalis should be given. This method is considered to have the advantage of permitting the use of larger doses than usual with less danger of renal complications in cases of infection due to the more resistant bacteria.

*The New England Journal of Medicine*, Vol. 236, p. 842, Robert N. Nye, M.D., Managing Editor.

### RADIOACTIVE PROGRESS

IN DELIVERING the twenty-fourth Mackenzie Davidson Memorial Lecture of the British Institute of Radiology, Dr. John Lawrence, of the Crocker Radiation Laboratory, Berkeley, California, brought with him the first analysis of 90 cases of polycythemia vera treated with P<sup>32</sup>, and 20 further cases which had not been. His real controls were, however, a Mayo Clinic series of 163 cases.

of which the survivors at the end of five years numbered 36. This proportion is liable to revision, but is now regarded as the best figure available.

Of the 90 cases treated at Berkeley, the earliest goes back to 1939, and the number of deaths to date has been 13. Also, whereas the average age of those treated was 48 years, the average age of those who died was 66.6 years. More encouraging even than these overall figures was the analysis given of causes of death. These included 4 cases of cardiovascular disease (of which 3 were at ages between 70 and 80), 1 of acute pancreatitis, and 3 of carcinoma. None of these 8 deaths was regarded as attributable to, nor was there any evidence in the 3 latter cases of induction of, carcinoma.

At the most, therefore, only 5 cases remained in which it appeared possible that the cause of death could reasonably be connected with either the polycythemia or the treatment given for it. As to 4 out of these 5 cases (3 leukemia and 1 multiple myeloma) no useful opinion could be expressed. Finally, there was only one death from thrombosis in the whole series, which in most previous series has been a common sequel. Follow-up studies are being continued, but in relation to the severity of the disease, radio-phosphorus therapy would appear to have already been justified.

As two examples of the tracer technic of direct and related interest to medicine, Dr. Lawrence instanced the use of radio-sodium and radio-gold for the study of the symptoms and treatment, respectively, of rheumatoid arthritis. The effect in the former case has been to confirm quantitatively the clinical picture of impaired circulation.

Using a rabbit, in one leg of which arthritis had been chemically induced, it was demonstrated with radio-sodium ( $\text{Na}^{24}$ ) that the rate of blood flow in the affected leg was nearly twice as slow to the articular cortex, more than three times as slow to the synovia, and more than four times as slow to the tendons as in the other and normal leg. On the side of treatment, it has been similarly shown with the aid of radio-gold ( $\text{Au}^{198}$ ) that the distribution of colloidal gold is such as to lend plausibility at least to this form of therapy. The concentration in the synovia has proved to be rather more than ten times as great as in the muscles, so that absorption may fairly be claimed to be

selective to that extent—although, as Dr. Lawrence was careful to point out, the presence of gold in the desired locations provides no proof in itself of beneficial effect.

*British Medical Journal, July 26, 1947, p. 139.*

## ECZEMA AND ESSENTIAL FATTY ACIDS

**I**NFANTILE eczema can be a most intractable condition, distressing in different ways to infant, parent and medical attendant. The relation of its occurrence to a disturbance in essential fatty acid metabolism has been the subject of investigation for some time now and appears to offer encouraging possibilities. Arild E. Hansen, Elizabeth M. Knott and Hilda F. Wiese, of Texas, and Eve Shaperman and Irvine McQuarrie, of Minneapolis, in a combined paper have presented recent investigations and their conclusions.

A total of 225 patients with eczema were investigated both clinically and by the study of their blood lipids. The findings in 101 control subjects were used in evaluating the significance of the blood lipid studies; the only practicable control method in the clinical approach was by the use, for observation, of preliminary "control periods" usually of four or more weeks, before any significant change was made in the therapeutic regimen.

Serum lipid studies on 171 of the eczematous patients disclosed that 80 per cent of infants under two years of age, 75 per cent of children between two and fifteen years, inclusive, and slightly over 50 per cent of adults had iodine numbers for the serum fatty acids below the mean values found for the 101 controls. When used as the sole form of therapy for 148 eczematous patients of various ages, addition to the diet of fats rich in unsaturated fatty acids, such as fresh lard and certain vegetable oils, produced a clinical response judged to be good to excellent in 60 and fair to good in 51 instances. The remaining 37 patients showed slight to no benefit. Most of the latter were in the older age group. The lard, which was sometimes mixed with other more palatable foodstuffs, was given in amounts averaging one to two ounces daily.

Periodic studies of the serum lipids for patients

with eczema revealed a tendency for the iodine numbers of the serum fatty acids to increase as the clinical condition improved following supplementation of the diet with fats rich in unsaturated fatty acids. An increase in the degree of unsaturation of the serum fatty acids was observed also to coincide with clinical improvement of patients treated solely with crude coal tar ointment.

Hansen and his co-workers, while being convinced of the clinical improvement which follows the inclusion in the diet of fats rich in unsaturated fatty acids, emphasize the importance of meticulous investigation and the use of other forms of treatment. In their experience the combination of the unsaturated fatty acid regimen with such therapeutic procedures as topical applications of crude coal tar ointment and elimination from the diet of all foods to which the patient is known to be sensitive has proved to be most successful. Their results among infants were much better than those among adults.

It seems likely that benefit will come from the administration of unsaturated fatty acids to patients, especially infants suffering from eczema, but such therapy is at present rather empirical.

*The Medical Journal of Australia*, Vol. 1 of 1947, p. 709.

## CIRCULATORY CHANGES WITH POSITION

ERECT posture, according to the hinologists, developed because man's prngenitors were tree dwellers. The fact that he walks on two legs gave him free use of his hands, and thus made possible the use of tools and subsequent intellectual development. Upright posture has also been blamed for many chronic diseases: circulatory disorders such as varicose veins, descent or prolapse of various organs, and various digestive disturbances.

Various means have been employed to measure blood shift in the body, blood volume changes, and their physiologic effects. One of the recently studied methods is by determination of the center of gravity of the body, which changes during the fatigue of standing and after static effort. According to Larsen, the changes of center of gravity

after standing show an excessive accumulation of blood in the lower parts of the body with draining of the upper part. The resulting under-oxidation of the brain parallels the early onset of fatigue.

Other workers have used the reactions of the body after tilting from the horizontal position, as a measure of recent blood loss. Green and Metheny of Seattle, note changes in the heart rate and blood pressure after postural changes, and have attempted to correlate these with a clinical method of estimation of the patient's blood volume and amount of recent hemorrhage. Blood volume estimations by the dye method, they remark, though known for many years, are so cumbersome as to be very little used. They studied normal persons before and after venesection of known amounts of blood, and patients admitted for recent gastrointestinal or other hemorrhage.

The subjects were placed on a fluoroscopy table and tilted at several different angles from the supine position. Changes in the heart rate and blood pressure and a break in compensation occurred on tilting of persons who had lost blood. The more blood had been withdrawn, the more acute the symptoms and the greater the cardiac acceleration to tilting. They conclude that an increase in heart rate of less than twenty-five beats per minute on raising the patient to a standard angle, in the absence of a syncopal reaction, indicates either a negligible or a compensated blood loss, which does not require transfusion. An increase on tilting of 30 beats or more per minute suggests a probable loss of 9 to 14 cc. of blood per kilogram, and a transfusion requirement of 1,000 cc. Syncopal reaction to tilting suggests need of 1,500 cc. of blood. Shock maintained in the supine position indicates a probable blood volume deficit of 20 cc. per kilogram and need for a 2,000 cc. transfusion. Hemoglobin level has no relation to blood volume, and may fall as blood volume rises.

This work emphasizes the importance of the horizontal position as therapy. Heart rate and blood pressure changes should probably be observed carefully in persons permitted to rise early after operation or after an obstetric delivery in which hemorrhage has occurred.

*Southern Medical Journal*, Vol. 40, No. 9, p. 796.

## Observations on the Psychology of the Tuberculous\*

GEORGE DAY

RESIDENT PHYSICIAN, MUNDESLEY, SANATORIUM, NORFOLK, ENGLAND

THE material for this study is drawn from a rather specialized class of tuberculous patients. Our patients are mostly hard-working, professional men and women who pay for sanatorium treatment, and are drawn from the Army, the Navy, the Church, and the stage—bar-risters, doctors, schoolmasters, business men, and their wives, sons, and daughters.

The patients have not been subjected to the stresses and strains classically held to be responsible for pulmonary tuberculosis—malnutrition, overcrowding, bad working conditions, or exposure. Then why do they break down? Obviously because they have become infected by the tubercle bacillus (as we all do); but for some reasons their tissues are in a condition to give it a good home instead of destroying it or imprisoning it for life. Is it just by chance that their tissues are so hospitable?

In 1935 I noticed a striking thing. So often there emerged from the patient's recent history an unhappy love episode. Girls had been jilted, young men had become engaged to the utterly wrong girl, and were in painful conflict realizing it more or less consciously. This state of affairs seemed to be far commoner than chance would warrant. It looked as if the Victorian novelists had got hold of a little-understood truth when they portrayed their lovelorn heroines going into a decline.

Another puzzling aspect was that tuberculosis struck down young adults. Why? The physical body should surely then be at its prime. It is fully grown: metabolism is no longer concerned in part

with growth and development but entirely with repair and replacement. Could the answer be that young adulthood is a time when emotional stresses reach their highest peak? In the group I am discussing, it is a time for weaning from the family circle and the backing and security of the home. Then men in particular have to stand on their own feet and accept the consequences of their choice, be it of helpmeet or lifework. It is a time of hopefulness, too much hopefulness perhaps; but it is a worrying time, indeed a frightening and suicidal time for some.

In 60 per cent of these cases I could discern a very good reason why tuberculosis or some similar chronic incapacitation was necessary to them at that juncture. I could also see why it would continue to be necessary to them, unless something in their life-pattern suffered change. But it was disappointingly seldom that I was able to do anything to bring the change about.

So in 30 per cent of the whole sanatorium population, I decided, the patient was sick in mind as well as body.

### CASE OF THE YOUNG DOCTOR

My first case is that of a young Irish doctor who developed pulmonary tuberculosis while doing a house physician's job in the south of England.

Alan was a popular stocky little fellow, full of vitality, who rapidly became persona grata with everyone in the sanatorium. His lesions, however, failed to respond to treatment, and he was still on bed rest at the end of six months. An artificial pneumothorax was attempted, but it did not relax the cavity-containing zone, because there was an intractable adhesion holding it out. He had a three-month course of "Sanocrysin" injections with-

\*A paper read to the Northfield Psychiatric Society, Northfield Military Hospital, Birmingham, and reprinted, in part, from *The Lancet*.

out converting his sputum even temporarily. At the end of six months his general condition was good; he had gained lots of body-weight and looked and felt fighting fit, but his rectal temperature rose to 99.7° F. each evening; his sputum, though scanty, was still positive; his blood-sedimentation rate remained steadily higher than it should have been. His disease activity was in statu quo.

Then we crushed his phrenic nerve. It worked like a charm. His diaphragm rose and within a few days his temperature had dropped to normal limits. His B. S. R. dropped steadily and he was sputum-free. And then he awoke early one morning with glove-and-stocking anaesthesia. Being a doctor, he had diagnosed it himself before we could answer his bell, and we found him bellowing, "Why the hell have I got a conversion hysteria?" It was no good asking *us*. We didn't know. He started sweating almost continuously; he couldn't sleep; and by the end of the week he had shrunk a stone in weight.

Then one evening in a darkened room he told his story. He was a Roman Catholic, and his fiancée, who was an extremely nice girl, was also a Roman Catholic. But he was possessed, as it were, of two personalities, a saint who was a devout practicing Roman Catholic and a sinner who wasn't; and they were not on speaking terms. The saint adored his beloved with religious fervour, but the sinner treated her differently. His fiancée was devoted to him, but was shamed at being forced to enjoy pre-nuptial bliss against her better inclinations. So their relationship became degraded in both their eyes, and they were pretty miserable though deeply in love with each other. I think it is significant that he took a house-job in the south of England—just about as far from Ireland as he could get.

Here he became involved with a nurse, developed the signs and symptoms of tuberculosis (with, he confessed, no little feeling of relief), and sped back to Ireland to his mother and his fiancée. He was not too easy there and he again elected to return to Mundesley, where he was happy, carefree, and well esteemed by his fellows. Now, when he showed signs of getting better of his tuberculosis, he himself gets very sick in spirit. It seemed obvious that he was not yet ready to re-enter the world from which tuberculosis had afforded him escape.

What seemed so odd to me was that he had never grouped all these phenomena in his own mind before; but then I suppose people don't. When it was pointed out to him, he did see it and he *did* see that the saint in him and the sinner in him had to be reconciled and come to terms and be atoned, if he wanted to become an integrated human being.

The next thing that happened was that he sent for his fiancée, confessed all, and was forgiven. He

made a rapid and uninterrupted progress from then onwards.

Two years later I ran into him again, and he was simply crackling with good health. But I noticed he did not introduce me to the girl he had with him. I couldn't help wondering whether the saint hadn't mixed a little too freely with the sinner, and ended up like the young lady from Riga.

#### FANTASIA

FROM a particular and completely unvarnished history I wish to turn to a blended version of several cases which had sufficient points in common for this operation. Here is an extract from an article I published pseudonymously just before the war:

"The most hopeless case is the one who exhibits what I call the 'Dornford Yates syndrome.' She (and it's nearly always a she) really believes that somewhere round the corner there exists such a world as that gifted writer portrays in his delirious fantasies: a world where women are worshipped from the crowns of their heads to their glittering insteps by clean-limbed leisured sportsmen with a taste for witty philandering; where every lawn is centuries old and every car a Rolls. It is a make-believe world we create whenever we put on evening dress and smoke cigars and behave a little above ourselves; but most of us accept the two-penny bus-ride back to reality with something like relief.

"The 'D. Y. S.' not only believes it exists, but that it is her rightful kingdom from which she is exiled. Disabling illness of any kind provides an escape from reality into a world which matches her fantasy. On her admission to a nursing-home or sanatorium she enters her kingdom—or should I say quondam? Enthroned in bed, she gains the power and the glory about which hitherto she has only been able to dream. Meticulous service she exacts from all who attend her. Visitors, inquiries, gifts of flowers, and exciting negligees all heighten the illusion. Her rapid unpopularity among the other patients is, of course, rationalized. 'The other patients dislike me, my dear, simply because the doctors make rather a favourite of me,' confided a Queen Me to a newcomer (who went to the trouble of ascertaining if it were true!)—"I have never been so neglected in my life," she once snapped at a giggling floor-maid, and added, skilfully avoiding understatement, "but then at home I had seven servants."—"Really, inum, would that be all together or one after another?" innocently asked the floor-maid; and was reported for impertinence.

"Reality has an uncomfortable way of breaking



through the best fantasies, and when it does, the time has come to move to another establishment, bearing horrific tales of the short-comings of the last one which forced the patient to abdicate.

"Now, the striking feature about cases of this kind is not that the disease runs a sluggish and protracted course, but that all attempts at adjuvant treatment seemed doomed. A malign Fate seems at work. A dramatic improvement once occurred when a husband's interest was found to be straying elsewhere. . . . But it might equally well have caused a dramatic decline, so it is not to be advocated. She is, after all, the victim of a disorder more intractable even than her tuberculosis, which is in comparison only a stage-property. She is perfectly adjusted to being an invalid, so why should she get well?"

#### PSYCHOLOGICAL ASSISTANCE

IN GENERAL practice, having decided an illness is functional and psychopathological in origin, one is faced with the problem—what is to be done about it? It is profoundly difficult to bring home to a patient one's conviction that he has within him a "black spot, not so big as a pin's head, but waiting to spread and destroy him in the fullness of time"—when the black spot is neither cancer nor tubercle but—Fear. Unless seriously distressed, patients in private practice are apt to take umbrage at the mere suggestion that they should undergo any systematic psychological treatment. It is an aspersion on their sanity. But delicate, difficult, and disagreeable as the task may prove, such a patient must have it brought home to him that he is sick at heart as well as in body, and that he can be helped to help himself. Before anything can be attempted he must become aware of a need for help and feel a genuine desire for it. Only then will he cooperate without doubts and misgivings.

Personally, I have found that dream analysis meets most situations, if you have the time; and in sanatorium practice you have plenty of time. It starts off like playing a new game, but soon becomes more and more engrossing and deeper and deeper in its effect, and eventually the patient gets the knack of analyzing his own dreams with a minimum of guidance. In fact, he does all the work, and in my happy experience, at this stage your presence is almost purely catalytic. If your suggestion misses the mark, it bounces off and is

ignored. You have done no harm. But if you hit the gold, it "brings him up all standing and carries away his bob-stay"; or perhaps, better still, your suggestion is angrily repudiated, resisted, and rejected. But you have sown the seed, and it is only a matter of time before it flowers.

A discontented ex-patient, who was living alone in lodgings in the village (rather than go home to her mother, putting off the evil day), used to come up to see me twice a week. Her mother was her chief immediate problem. The mother was a deaf and dowdy earnest woman who rather disliked her darling daughter but did not know it. The darling daughter detested her mother, knew it, and gloried in it.

One day the girl was pouring out a long dream with her own running commentary, but my mind was elsewhere. The village amateur dramatic society, I knew, was about to start work—just the thing for her! Give her a chance to meet some people purposefully and not merely socially. She'd be able to give herself a much-needed rest for two or three evenings a week. Impulsively I blurted out, "Are you interested in amateur theatricals?" "I *loathe* amateur theatricals," she replied. "Why?" "All right, all right. Don't snap my head off. Nothing, nothing. Go on. I'm listening."

Next time she came to see me, she said, "Sorry I was dense. The penny didn't drop until the next day. I know now why you asked me about amateur acting. It's perfectly true; I *am* dramatizing myself the whole time. I never realized it before. What can I do about it? I find I'm doing it the whole time, blast you." For the first time she was completely natural.

And that is the way of it. Very often one's most cryptic utterances, which one could not explain or defend if challenged, may bear fruit.

In my next case I used dream analysis and unearthed material I could not possibly have got any other way, for the patient was intelligent and intellectual and had an almost maddening amount of poise.

She had read more Freud than I had, and thought there was a tremendous lot in it—applied to other people. By his standards she judged herself to be pretty well all right. This patient was a doctor's wife and therefore had not been diagnosed until both her lungs had become pretty extensively excavated. She was treated with bilateral A. P. S., adhesions were cauterized on both sides, and from the viewpoint of pure lung-carpentry we achieved what we wanted. But she did not heal.

Her dreams showed clearly that her marriage

was a failure—more, that it was in effect her wasting disease of which her tuberculosis was a somatic expression. She had never admitted that she was ill-mated, even to herself. Her husband, who had a touch of the Asiatic in his blood, was an expert and experienced love-maker. One moment he fascinated and terrified her by his ruthlessness, and the next could put on a "hurt small boy" act which never failed to arouse her motherly feelings. At every turn she was completely in his power and completely frustrated from being herself when he was about.

One dream I would like to relate without comment. She was fishing in clear, deep water from the lower steps of a jetty, when suddenly a sort of Loch Ness monster reared its ugly head and rushed across the bay straight at her. She turned, screaming in terror, and fled up the steps to me, who was standing at the top, and awoke.

Eventually she decided to divorce her husband for cruelty, both mental and physical, for which she had a very good case, and her papers were sent in. Her tuberculosis which had hung fire all these months began to get better.

The case was defended and lasted three days. She had a gruelling time in the box, for her ruthless husband had left no sofa-cushion unturned in his search for letters of one sort or another with which to bolster up his counter-evidence. She came through well and won hands down.

After the decree nisi she was forced to have embarrassing dealings with her ex-husband concerning the welfare of their joint children, and her emotions towards him were rather confused. He was so charming, courteous, and considerate.

She continued to send me her dreams with her own interpretations for my comments. And this is the last one she sent me. She was fishing in deep, clear water from the lower steps of a jetty, as in the other dream, but on the other side facing east instead of west. Suddenly a sort of Loch Ness monster reared its ugly head and rushed across the bay at her. She turned, screaming in terror, and was about to flee up the steps, when she heard me chuckling with amusement. So she stood her ground and seized the monster in both hands. It shrank and shrank until it was a poor little iridescent minnow in the palm of one hand. She gently threw it back into the water.

(I will comment on this second dream. I think it pretty decent of her unconscious to drop us a line to let us know how we are getting on.)

She married again, this time a man more her own weight, somebody who laughs at the same things as she does, and her tuberculosis is arrested.

#### HAPPINESS IS NOT ENOUGH

TO ME, concerned with getting people to overcome tuberculosis by fair means or foul, that case strengthens my belief that a change of heart and a change of circumstances must be necessary before healing will proceed. My next one shows the effect of change of circumstances alone:

Peggy had an unfortunate early history. She never knew her father, her mother died when she was fourteen, and from then onwards she was self-supporting. She was in turn parlor-maid, cook, chorus girl, shop girl, mannequin, and glamor girl. She worked her way out to Canada as a stewardess and back again when she'd had enough. She then married a rather worthless playboy racing-motorist who was pretty poor, both in money-sense and woman-sense. She had to sell her jewels to keep him, and to work in a hat-shop to earn the rent for their flat. He contributed nothing unless he backed a winner with his pocket-money, when they hlued it with the greatest enjoyment. It was only when he diverted her hard-earned rent to another woman's lap that she protested, walked out on him, and put in her papers for a divorce.

We next find her settled down comfortably as a young farmer's wife, leading a happy outdoor life, riding, rearing, and breaking in colts, tending the poultry-farm, and having lovely fun in the kitchen. It was an idyllic existence. The young couple were deeply in love with each other and the young farmer lavished all the good things on her that she had lacked before.

After a couple of years she developed a small patch in one lung and reddening of one arytenoid. These were discovered almost accidentally, one might say, owing to the thoroughness of her general practitioner; for there were no physical signs. It was for other symptoms she consulted him. She was six weeks' pregnant. In accordance with general usage she was advised to have therapeutic abortion, and this was done. After which no time was lost getting her under sanatorium treatment, where she was put on absolute rest.

From the hardships she had gone through she might have been by now a hard-bitten, disillusioned young woman; but she was not. She was one of the sunniest and sweetest young women I have ever met. Nothing disturbed her infectious gaiety. She bubbled with fun and friendliness. Everybody fell for her, women in particular. She had managed to acquire and cherish some delight in poetry, music, and sketching. She was the adored adopted aunt of about half a dozen children.

Her tuberculosis spread in both lungs, larynx, and trachea. Each x-ray film showed advancing

through the best fantasies, and when it does, the time has come to move to another establishment, bearing horrific tales of the short-comings of the last one which forced the patient to abdicate.

"Now, the striking feature about cases of this kind is not that the disease runs a sluggish and protracted course, but that all attempts at adjuvant treatment seemed doomed. A malign Fate seems at work. A dramatic improvement once occurred when a husband's interest was found to be straying elsewhere. . . . But it might equally well have caused a dramatic decline, so it is not to be advocated. She is, after all, the victim of a disorder more intractable even than her tuberculosis, which is in comparison only a stage-property. She is perfectly adjusted to being an invalid, so why should she get well?"

#### PSYCHOLOGICAL ASSISTANCE

IN GENERAL practice, having decided an illness is functional and psychopathological in origin, one is faced with the problem—what is to be done about it? It is profoundly difficult to bring home to a patient one's conviction that he has within him a "black spot, not so big as a pin's head, but waiting to spread and destroy him in the fullness of time"—when the black spot is neither cancer nor tubercle but—Fear. Unless seriously distressed, patients in private practice are apt to take umbrage at the mere suggestion that they should undergo any systematic psychological treatment. It is an aspersion on their sanity. But delicate, difficult, and disagreeable as the task may prove, such a patient must have it brought home to him that he is sick at heart as well as in body, and that he can be helped to help himself. Before anything can be attempted he must become aware of a need for help and feel a genuine desire for it. Only then will he cooperate without doubts and misgivings.

Personally, I have found that dream analysis meets most situations, if you have the time; and in sanatorium practice you have plenty of time. It starts off like playing a new game, but soon becomes more and more engrossing and deeper and deeper in its effect, and eventually the patient gets the knack of analyzing his own dreams with a minimum of guidance. In fact, he does all the work, and in my happy experience, at this stage your presence is almost purely catalytic. If your suggestion misses the mark, it bounces off and is

ignored. You have done no harm. But if you hit the gold, it "brings him up all standing and carries away his bob-stay"; or perhaps, better still, your suggestion is angrily repudiated, resisted, and rejected. But you have sown the seed, and it is only a matter of time before it flowers.

A discontented ex-patient, who was living alone in lodgings in the village (rather than go home to her mother, putting off the evil day), used to come up to see me twice a week. Her mother was her chief immediate problem. The mother was a deaf and dowdy earnest woman who rather disliked her darling daughter but did not know it. The darling daughter detested her mother, knew it, and gloried in it.

One day the girl was pouring out a long dream with her own running commentary, but my mind was elsewhere. The village amateur dramatic society, I knew, was about to start work—just the thing for her! Give her a chance to meet some people purposefully and not merely socially. She'd be able to give herself a much-needed rest for two or three evenings a week. Impulsively I blurted out, "Are you interested in amateur theatricals?" "I loathe amateur theatricals," she replied. "Why?" "All right, all right. Don't snap my head off. Nothing, nothing. Go on. I'm listening."

Next time she came to see me, she said, "Sorry I was dense. The penny didn't drop until the next day. I know now why you asked me about amateur acting. It's perfectly true; I *am* dramatizing myself the whole time. I never realized it before. What can I do about it? I find I'm doing it the whole time, blast you." For the first time she was completely natural.

And that is the way of it. Very often one's most cryptic utterances, which one could not explain or defend if challenged, may bear fruit.

In my next case I used dream analysis and unearthed material I could not possibly have got any other way, for the patient was intelligent and intellectual and had an almost maddening amount of poise.

She had read more Freud than I had, and thought there was a tremendous lot in it—applied to other people. By his standards she judged herself to be pretty well all right. This patient was a doctor's wife and therefore had not been diagnosed until both her lungs had become pretty extensively excavated. She was treated with bilateral A. P. S., adhesions were cauterized on both sides, and from the viewpoint of pure lung-carpentry we achieved what we wanted. But she did not heal.

Her dreams showed clearly that her marriage

was a failure—more, that it was in effect her wasting disease of which her tuberculosis was a somatic expression. She had never admitted that she was ill-mated, even to herself. Her husband, who had a touch of the Asiatic in his blood, was an expert and experienced love-maker. One moment he fascinated and terrified her by his ruthlessness, and the next could put on a "hurt small boy" act which never failed to arouse her motherly feelings. At every turn she was completely in his power and completely frustrated from being herself when he was about.

One dream I would like to relate without comment. She was fishing in clear, deep water from the lower steps of a jetty, when suddenly a sort of Loch Ness monster reared its ugly head and rushed across the bay straight at her. She turned, screaming in terror, and fled up the steps to me, who was standing at the top, and awoke.

Eventually she decided to divorce her husband for cruelty, both mental and physical, for which she had a very good case, and her papers were sent in. Her tuberculosis which had hung fire all these months began to get better.

The case was defended and lasted three days. She had a gruelling time in the box, for her ruthless husband had left no sofa-cushion unturned in his search for letters of one sort or another with which to bolster up his counter-evidence. She came through well and won hands down.

After the decree nisi she was forced to have embarrassing dealings with her ex-husband concerning the welfare of their joint children, and her emotions towards him were rather confused. He was so charming, courteous, and considerate.

She continued to send me her dreams with her own interpretations for my comments. And this is the last one she sent me. She was fishing in deep, clear water from the lower steps of a jetty, as in the other dream, but on the other side facing east instead of west. Suddenly a sort of Loch Ness monster reared its ugly head and rushed across the bay at her. She turned, screaming in terror, and was about to flee up the steps, when she heard me chuckling with amusement. So she stood her ground and seized the monster in both hands. It shrank and shrank until it was a poor little iridescent minnow in the palm of one hand. She gently threw it back into the water.

(I will comment on this second dream. I think it pretty decent of her unconscious to drop us a line to let us know how we are getting on.)

She married again, this time a man more her own weight, somebody who laughs at the same things as she does, and her tuberculosis is arrested.

#### HAPPINESS IS NOT ENOUGH

TO ME, concerned with getting people to overcome tuberculosis by fair means or foul, that case strengthens my belief that a change of heart and a change of circumstances must be necessary before healing will proceed. My next one shows the effect of change of circumstances alone:

Peggy had an unfortunate early history. She never knew her father, her mother died when she was fourteen, and from then onwards she was self-supporting. She was in turn parlor-maid, cook, chorus girl, shop girl, mannequin, and glamor girl. She worked her way out to Canada as a stewardess and back again when she'd had enough. She then married a rather worthless playboy racing-motorist who was pretty poor, both in money-sense and woman-sense. She had to sell her jewels to keep him, and to work in a hat-shop to earn the rent for their flat. He contributed nothing unless he backed a winner with his pocket-money, when they blued it with the greatest enjoyment. It was only when he diverted her hard-earned rent to another woman's lap that she protested, walked out on him, and put in her papers for a divorce.

We next find her settled down comfortably as a young farmer's wife, leading a happy outdoor life, riding, rearing, and breaking in colts, tending the poultry-farm, and having lovely fun in the kitchen. It was an idyllic existence. The young couple were deeply in love with each other and the young farmer lavished all the good things on her that she had lacked before.

After a couple of years she developed a small patch in one lung and reddening of one arytenoid. These were discovered almost accidentally, one might say, owing to the thoroughness of her general practitioner; for there were no physical signs. It was for other symptoms she consulted him. She was six weeks' pregnant. In accordance with general usage she was advised to have therapeutic abortion, and this was done. After which no time was lost getting her under sanatorium treatment, where she was put on absolute rest.

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Her tuberculosis spread in both lungs, larynx, and trachea. Each x-ray film showed advancing

shadows, until each lung looked like a snowstorm. She had to talk in whispers, and her swallowing of food was painful to watch. It was evident that she was going to die, and that nothing could be done.

A week or so before the end she developed a strong positive transference towards me; so I took to sitting with her at night when her dyspnoea frightened her, until her opiate took effect and she dropped off to sleep.

It was then that I learned her history and her bewildered attitude towards it. Her divorce had never gone through; so she had never been able to marry Bill, the young farmer. But that didn't worry her in the least; to her it was perfectly natural and right that she should make him happy. There was no feeling of guilt. She adored him; and her life with him and the horses, the ducks, and the goats *was* idyllic—but it was somehow unreal. Even had she been legally married to Bill, she would have continued to feel that her first unhappy marriage was the real one. Miserable and exasperated often, insecure always as she had been with the playboy, it was the small memories of midnight feasts—of a stray kitten they adopted on Christmas Eve and played with on the bed—it was memories like these that kept crowding in now. And then she said something startling. Without rancor or self-pity, without question and with complete acceptance, she said, "It looks as if I have a *need* to suffer." She died that night. There was no mistake about the dose of morphia.

I feel that her history is worth giving in some detail, because it has features in common with two other women patients. In all three cases there had been an unhappy but curiously vital first marriage, and a brief glimpse of happiness and security in a second unlegalised alliance, which seemed to them unreal and dreamlike in comparison. In all three the disease was diagnosed early and brought early to treatment without avail. They all lost their good looks and became skull-faced, with bodies and legs bloated with edema. All three had sweet sunny dispositions, which persisted undimmed to the end in spite of their afflictions.

#### NATURE OF THE DISEASE

**M**Y TENTATIVE conclusions are that patients who develop pulmonary tuberculosis in the absence of any classical physical environmental causes often do so because of disease in their psychological environment—their relation to themselves or to the world outside.

We are all agreed that certain physical distressing circumstances lower a patient's resistance to disease, but that is only an empirical phase to cover everyday experience. We really know nothing yet about the biochemical tissue changes (if any) that are involved when "resistance is lowered." We are only saying really that the soil is being made ready for the seed. The patient's tissues are ready to be diseased. In psychological distress the patient as a whole is ready to be ill—in fact, is ill already. And the ubiquitous bacilli both endogenous and exogenous are there ready to oblige.

This is tantamount to saying that tuberculosis provides means for a flight from frustration, for self-punishment and all those other dark urges which are continually shipwrecking our best behavior. I believe this, with half of me; but my alter or super ego would like to have mathematical confirmation. I cannot be whole-hearted until we can measure in grams per liter the presence or absence of disease-resisting substances in the body fluids.

Even if we cannot accept that thesis fully, I think we must agree to the generalization that every individual reacts to a disease according to his personality; from which it must follow that the psychoneurotic, when given a touch of tuberculosis, will exploit his disease process to suit his pattern of living—or of dying. Moreover, such a patient may develop a secondary reactive personality, of which the disease is a complementary and necessary part, as in the "Dornford Yates syndrome" I described earlier.

Obviously, if such a patient is to recover from his tuberculosis, we must treat more than the local lesions and the toxic manifestations. His concurrent psychological disease must be alleviated, and alleviated in good time, if he is to recover and not become chronic or incurable. Time itself is notoriously a great healer in cases of emotional maladjustment that are not basic. The period of retreat in a sanatorium—that mother figure—brings about changes in both the inner and outer lives of many, probably most patients. They overcome the disease when they are ready. But for quite a few cases it would be as well if psychiatric help and guidance were at hand to expedite their readjustment.

# New Drugs

Information published in this department has been supplied by the manufacturers of the products described.

## FOLIC ACID

(Squibb Therapeutic Formula-Modified and Squibb Special Formula-Modified)

PURPOSE: Bone marrow stimulant.

COMPOSITION: Each capsule of Therapeutic Formula-Modified contains:

	Units		Mg.
Vitamin A	25,000	Riboflavin	5
Vitamin D	1,000	Niacinamide	150
	Mg.	Ascorbic acid	150
Thiamine HCL	10	Folic acid	5

Each capsule of Special Formula-Modified contains:

	Units		Mg.
Vitamin A	5000	Riboflavin	3
Vitamin D	800	Niacinamide	20
	Mg.	Ascorbic acid	75
Thiamine HCL	3	Folic acid	1

INDICATIONS FOR USE: Therapeutic Formula-Modified for treatment for deficiency states associated with certain macrocytic anemias. Special Formula-Modified for maintenance therapy.

DOSAGE AND METHOD OF ADMINISTRATION: By prescription.

HOW SUPPLIED: Therapeutic Formula-Modified—Bottle of 100, \$22; bottle of 1,000, \$198. Special Formula-Modified—Bottle of 100, \$6.77; bottle of 1,000, \$63.30.

PRODUCER: E. R. Squibb & Sons, New York 22, N. Y.

## MULSAVITE

PURPOSE: To provide a therapeutic multivitamin preparation permitting prescription of any multiple of five times the minimal daily requirements.

COMPOSITION: Each capsule contains:

	Units		Mg.
Vitamin A	20,000	Pyridoxine	
Vitamin D	2,000	Hydrochloride	1
		Calcium	
	Mg.	pantothenate	10
Thiamine		Niacinamide	50
Hydrochloride	5	Ascorbic acid	150
Riboflavin	10	Mixed tocopherols	10

INDICATIONS FOR USE: Conditions requiring multivitamin therapy.

DOSAGE AND METHOD OF ADMINISTRATION: By prescription of the physician.

HOW SUPPLIED: In bottles of 30 and 500 capsules.

PRODUCER: Sharp & Dohme, Inc., Philadelphia 1, Pa.

## ESTROGEN-PROGESTERONE SOLUTION

PURPOSE: Combined estrogen-progesterone therapy.

COMPOSITION: Each cc. of solution contains:

Natural estrogenic substance	20,000 I.U.
Crystalline progesterone	10 mg.

DESCRIPTION: The hormones are carried in sesame oil with chlorobutanol added as a preservative.

INDICATIONS FOR USE: In treatment of secondary amenorrhea (Zondek's technic), of habitual abortion according to Vaux and Rakoff. Menorrhagia and ovarian failure frequently respond to therapy with the combined hormones.

DOSAGE AND METHOD OF ADMINISTRATION: In treatment of amenorrhea, 1 cc. is injected intramuscularly for 2 to 5 days. In treatment of habitual abortion, 1 cc. is injected intramuscularly 2 or 3 times weekly from the fourth to the tenth week of gestation. In menorrhagia, 1 cc. is given for 2 to 5 days. Dosage for ovarian failure should be individualized.

CAUTIONS: This preparation should not be used if needle therapy is contraindicated or if underlying pathology precludes its successful use.

HOW SUPPLIED: In 5 cc. rubber capped multiple dose vials.

PRODUCER: George A. Breon & Co., Kansas City 10, Mo.

## SEARLE HYDRYLLIN

PURPOSE: An antihistamine for allergic manifestations. COMPOSITION: 25 mg. (3/8 grain) of Searle Diphenhydramine and 100 mg. (1 1/2 grains) of Searle Aminophyllin.

DESCRIPTION: This histamine antagonist, Searle Hydryllin, combines two therapeutically effective agents—diphenhydramine and Aminophyllin. Diphenhydramine is the name accepted by the Council on Pharmacy and Chemistry of the American Medical Association for  $\beta$ -dimethylaminoethyl benzohydryl ether. Hydryllin has the advantage over other antihistaminics in that in addition to containing diphenhydramine, it also furnishes the well-known stimulating and spasmolytic effects of Searle Aminophyllin. Searle Aminophyllin is definitely spasmolytic in action and Searle Diphenhydramine is antihistaminic. The diphenhydramine and Searle Aminophyllin, as optimally combined in Hydryllin, were so combined as to curtail, or at least appreciably diminish, the depression (drowsiness and las-

situde) incident to the use of diphenhydramine hydrochloride alone.

**INDICATIONS FOR USE:** Hydryllin has been found effective in all allergic conditions in which antihistaminics are indicated; for example, urticaria, hay fever, allergic rhinitis, allergic rhinitis with asthma, asthma and atopic and eczematous dermatitis.

**DOSAGE:** The recommended dosage, preceded by a test dose of one tablet, is one or two tablets three or four times daily. The minimal dose should always be used which will relieve the symptoms.

**HOW SUPPLIED:** Hydryllin is supplied in bottles of 100 tablets.

**PRODUCER:** G. D. Searle & Co., Chicago 80, Ill.

### CASEIN HYDROLYSATE

**PURPOSE:** To provide all the essential amino acids, as well as peptides and polypeptides in a preparation of high nutritive value

#### COMPOSITION:

##### Essential Amino Acids:

Arginine*	2.9%	Phenylalanine	4.6%
Lysine	6.7%	Valine	5.9%
Tryptophane	1.1%	Methionine	2.7%
Threonine	4.3%	Isoleucine	5.9%
Histidine*	2.7%	Leucine	8.7%

also

Cystine	0.4%	Tyrosine	2.8%
Total Nitrogen	13.5%	Carbohydrate	0.0%
Amino Nitrogen	3.4%	Fat	0.0%
Sodium	2.0%	Calories/gram	3.8
Total Ash	5.4%	Calories/ounce	110.0
Moisture	4.0%		

Purines, including nucleic acid—None.

\*Authorities differ as to essentiality in man.

**DESCRIPTION:** Fine granular solid, light buff in color.

#### INDICATIONS FOR USE:

##### Established:

1. To promote wound healing and convalescence by replacing loss of tissue and blood proteins in injury, including severe burns, or in acute or chronic disease.
2. To hasten the establishment of positive nitrogen balance postoperatively by rapid replacement of the nitrogen losses which have been described as toxic destruction of nitrogen.
3. To increase the resistance of surgical patients by establishing normal plasma globulin patterns.
4. To facilitate the management of patients with gastrointestinal disturbances by providing effective protein nutrition.

#### DOSAGE AND ADMINISTRATION:

Dosage is determined individually for each patient on basis of diagnosis, physical condition and weight.

Casein Hydrolysate is intended for oral administration, but because it is completely soluble it may also be administered by tube, either by mouth or rectally. It should *not* be administered parenterally.

#### CAUTIONS:

For patients who take little or no other food, carbohydrate should be added to the hydrolysate, up to an amount equal in weight to that of the hydrolysate. To maintain the desired caloric and nutritive balance, the proportion of carbohydrate added to the hydrolysate should be progressively reduced as the caloric intake in natural food increases.

**HOW SUPPLIED:** One-pound bottles.

**LIST PRICE:** 1 lb. bottle—\$4.75.

**PRODUCER:** E. R. Squibb & Sons, New York, N. Y.

### BUNESIA

**PURPOSE:** Antispasmodic, sedative and antacid.

**COMPOSITION:** Each tablet contains 2.5 mg. homatropine methylbromide, 20 mg., Butisol sodium (sodium 5-ethyl-5-secondary butyl barbiturate), 300 mg. magnesium hydroxide, and aromatics.

**INDICATIONS FOR USE:** In treatment of irritable colon, peptic ulcer, gastric neurosis, chronic constipation, cardiospasm, pylorospasm, and aerophagia.

**DOSAGE AND METHOD OF ADMINISTRATION:** Four to six tablets a day, depending upon individual requirements.

**HOW SUPPLIED:** Green bisected tablets in bottles of 25, 100 and 500.

**PRODUCER:** McNeil Laboratories, Inc., Philadelphia 32, Pa.

### STREPTOMYCIN

**PURPOSE:** Antibiotic therapy.

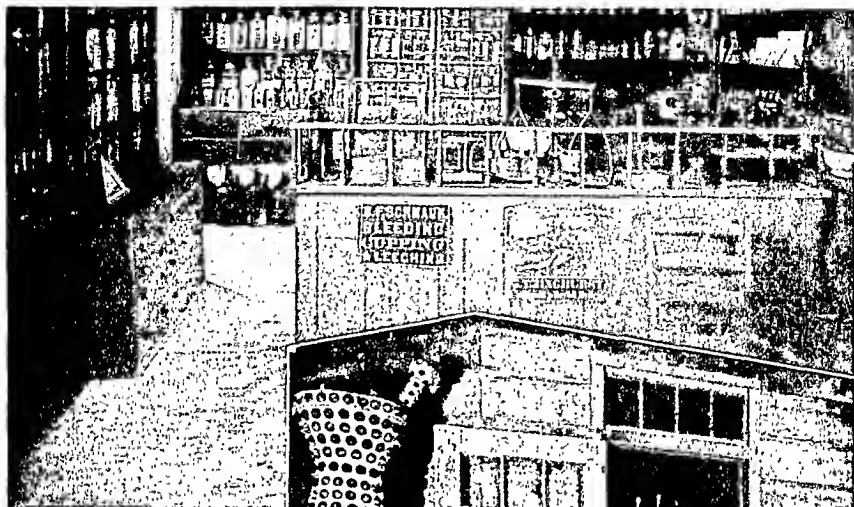
**COMPOSITION:** Each vial contains: streptomycin (as streptomycin sulfate)—1 g.

**INDICATIONS FOR USE:** Streptomycin, a basic antibacterial substance obtained from *actinomyces griseus* culture fluid, is effective in the treatment of tularemia, H. influenzae infections, gram-negative, bacillary, urinary, or systemic infections with or without bacteremia caused by E. coli, Ps. aeruginosa, K. pneumoniae, A. aerogenes, and Salmonella group of organisms.

**DOSAGE:** Intramuscular or subcutaneous injections of 1 to 3 g. daily. Intrathecal injections of 50 mg. daily may supplement intramuscular injections in H. influenza meningitis.

**HOW SUPPLIED:** In 1 g. vials.

**PRODUCER:** The Upjohn Company, Kalamazoo 99, Mich.



## Early American Apothecary Shop



A real hit at the recent A.M.A. meeting was Smith, Kline and French's 18th century apothecary shop, valued at \$25,000. Bought by the pharmaceutical house from Helen Penrose, New York antiquarian, it attracted 14,500 with its genuine old drug jars, scales, earthen jugs, mortars and pestles, denijohns, and scores of handblown bottles. As original prescription book of Dr. Joseph Bringham, who operated the pharmacy in 1793, was on display, as well as a copy of the first edition of "Pharmacopoeia," and an 1814 Dispensatory.



# After Hours

## BIG-GAME HUNTER

Big-game hunting is an activity usually identified with professional adventurers, wealthy sportsmen, and wild tribesmen. That it need not be limited to these people, however, is attested to by the experiences—and trophies—of Dr. Charles E. Boys, surgeon, of Kalamazoo, Michigan.

From the time Dr. Boys started his practice in 1904 until 1925, the only vacations he took were from two to four weeks each year when he would sit in the amphitheatres of various clinics to observe clinical surgery. But in 1925, when he was 45 years old, he joined a deer-hunting party in upper Michigan for his first "real" vacation.

Similar excursions in successive years developed a yearning for more distant hunting grounds and bigger game. Elk hunting in Wyoming and Montana followed, and the doctor managed to bring back some good trophies.

His next objective was Ontario, Canada, both east and west of Lake Superior, with moose as the game sought. Some moose were seen, but the "take" was so limited that the next move was to Alberta, Canada, where trips were made two different years. Moose and deer hunting were better, but there was also added the opportunity to attain that goal of all big-game hunters—mountain sheep and goats.

Then came an interesting hunting trip to Chihuahua, Mexico. Entering the country from El



CHARLES E. BOYS, M.D.

Paso, Texas, the doctor's party drove south about 200 miles to camp in the Sierra Madre Mountains. From one camp they obtained deer, antelope, quail, and wild turkeys. Bobcat, bear, wild boar and mountain lion also were to be found but no specimens of this latter group were taken.

On another occasion Dr. Boys motored from Nogales, Arizona to Matzatlan, Mexico, in quest of jaguar, but the weather was so dry that even the trained lion hounds could not follow the scent after mid-forenoon. The hunt was abandoned and the hunters substituted attendance at a bull fight at Matzatlan, and a sword fishing venture at Guaymas.

Dr. Boys' next trip was to the interior of Alaska, 20 miles up the Healy River from the little town of Healy. Camp supplies were transported from Healy by a wagon team, guided by a drunken

driver, for fifteen miles with the river bed as the only road. From that point supplies were packed five more miles to the campsite. Sheep were plentiful there and each hunter obtained his limit of two good heads.

The following year the doctor hunted near Skilak Lake in the Kenai Peninsula. To get there one took a boat from Seattle to Seward, Alaska; the railroad from Seward to Anchorage, and a plane from Anchorage to Tustamina Lake, about a hundred miles south; then walked 10 miles to camp.

This was and is the most famous moose country in the world. Many animals were seen before the guide would permit any of the party to shoot one. He was jealous about the kind of trophies they might bring in. From this area, Dr. Boys obtained a large bull, a cow, and a three-months-old calf, which now adorn a cubicle in the Kalamazoo Museum as whole mounts. From a near-by mountain sheep area, Indian River Canyon, specimens of a large ram, ewe, and lamb were obtained and these also have their permanent residence as mounts in the Kalamazoo museum.

The two trips to the interior of Alaska were followed by two others with interval of a year or so, to Kodiak Island, in quest of Kodiak bear. A coastal boat provided transportation from Seward to Larsen Bay cannery, whence the hunters were taken by plane to Lake Kenai, about thirty miles in-

# Psychiatric Aspects of Therapeutic Abortion

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THE problem of therapeutic abortion has never been entirely resolved to the satisfaction of many physicians. Social, moral, theological, economic, ethical, and legal factors combined with professional judgment frequently make the problem of interruption of pregnancy a complex one. It is felt that no doubt many physicians who have an open mind on the subject are reluctant to discuss it openly not only because they fear the criticism of their colleagues but because they have the more or less unconscious feeling that if one dwells too heavily on the topic, it may give the impression that one is carrying on some shady uterine manipulations.

## RELIGIOUS ASPECTS

The religious aspects of abortion are manifold. Because pregnancy is so closely associated with the origin of human life and religious dogmas, theological resistances to therapeutic abortion of any type are encountered constantly. Early Greeks and Romans condoned abortion when necessary. In the Jewish Talmud there are many admonitions against abortion.

For centuries the Christian church has taken

the point of view that pregnancy should not be interfered with. Modern-day Protestants, however, in general agree that a therapeutic abortion is acceptable in order to save the life of the mother. On the other hand, the Catholic church has remained inflexible and obdurate against abortion at any time or for any purpose. Perhaps the moral conduct of the individual in society is the basic reason religious leaders feel so opposed to medical intervention with the works of God.

## LEGAL ASPECTS

In some localities in America physicians accomplishing a therapeutic abortion might do well to consult the local statutes, since laws have notoriously lagged behind medical science and progress. Harris<sup>2</sup> has made an excellent study of abortion laws. In the vast majority of cases the law exempts from prosecution any person who procures an abortion for the purpose of saving the mother's life whether that person is a physician or not. In some instances the law indicates the advisability of medical consultation in deciding about an abortion. Since there are far more cases in which the future health of the mother, rather than her



FRANKLIN G. EBAUGH

life, are affected by pregnancy, four states make provisions for such a situation—Colorado, the District of Columbia, Maryland, and New Mexico.

It is well known that every possible means of escape is employed by the attorney for a professional abortionist, and not infrequently the jury finds the abortionist not guilty despite a mass of incriminating evidence. The more experienced criminal abortionist makes certain that neither the mother nor any of the family ever see him. Unless murder is involved, it is a fairly safe bet that the abortionist standing trial will be acquitted in the majority of cases. Very inaccurate and few figures are available regarding the convictions for criminal abortions in the United States. Rongy<sup>14</sup> shows that, according to the New York County Medical Society, only three abortionists were convicted and sentenced during a ten-year period, and all three were later pardoned by the governor. In many cases, the abortionist who is convicted

is not a duly licensed physician but an impostor, a naturopath, a chiropractor, or a charlatan.

#### STATISTICS

Certainly in the field of abortion, figures are more than naive. An estimate of the situation has been given by Taussig,<sup>10</sup> who believes that about 700,000 abortions occur annually. The number of abortion deaths is only partly available from the Bureau of the Census, and it has been estimated that at least 10,000 young women lose their lives annually as a result of uterine intervention. In Williams' *Textbook of Obstetrics* the ratio of abortions to confinements is given as one abortion to four or five confinements.

Bearle<sup>2</sup> made an analysis of abortion deaths in the District of Columbia for the years 1938, 1939, and 1940. She found 54 women died of abortions during that period. In connection with 4 of these deaths, 1 abortionist was tried and found guilty, 3 others were exonerated. During this period 12 abortionists were brought before the grand jury of the District of Columbia and 7 were indicted, including 2 licensed physicians, 1 forger, 1 auto mechanic, and 1 post-office clerk.

#### ENDOCRINE RELATIONSHIPS

The interrelationships between the endocrine system and emotional tensions and conflicts are intimate, complex, and of the greatest psychosomatic significance. Benedek and Rubenstein<sup>3</sup> have illustrated that the psychosomatic structure of the mature human female is a complex one and that a diversity of emotional reactions can be correlated with specific variations of hormone production.

THE basic normal pattern of physiologic and personality relationships may be stated about as follows: Following menstruation there is a gradual increase for 10 days to 2 weeks of the estrogenic or follicular hormones, and, paralleling this in a psychologic manner, there

is an extratensive feeling with interest in the opposite sex. After ovulation occurs, the effects of the estrogenic hormones are masked by the increase of the corpus luteum hormone, progesterone. Psychologically, with an increase of progesterone, flightiness, irritability, decrease in amount of interest in the opposite sex, and an increased interest in the woman herself occurs. There is an emotional preparation for nidation and motherhood. During the late premenstrual period the ego becomes weak. The emotional state at this time may be often characterized clinically as a depression. Women may be somewhat retarded, sad, apathetic, indifferent, and fatigued, and may show more marked emotional instability. Psychosomatic reverberations sometimes occur during the premenstrual phase, such as migraine, gastric distress, constipation, and skin eruptions. The ultimate goal of the sexual cycle in women is, of course, conception, pregnancy, and motherhood. The pregnant woman is prepared both physiologically and emotionally for her motherhood and for her offspring.

If economic and sociologic pressures from outside sources or bodily and mental disease of some nature result in the completion of a therapeutic abortion and an emptying of the uterus, then the hormonal levels, physiologic processes, and emotions are again reduced to the nonpregnant state. Psychosomatic processes must then return to a correlation with previous nonpregnant hormonal levels. These changes, coupled with ideas of guilt, self-depreciation, some recurrent preoccupation centering around infanticide, and the general theme of "I let them kill my baby," might well disturb a poorly integrated personality even to psychotic proportions.

Feelings of love, admiration, and respect for the male partner as a result of pregnancy may well be distorted in the aborted woman to ruminations of disgust, hate, and disrespect: "He gave me a baby and then took it away." The unconscious motivation and the ebb and flow of emotions during the readjustment to a "normal" sexual nonpregnant cycle may result in deeply ingrained feelings of hostility



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toward the husband. Thus the desire for heterosexual experience may be stifled.

The psychic apparatus, it has been shown, reacts strongly to inadequate estrogen production, and the abrupt change to the nonpregnant status is usually manifested by many of the psychosomatic reverberations listed by Hamilton.<sup>7</sup> Abortions leave a psychologic cicatrix.

In a follow-up study by Hamilton of the psychologic attitude of 100 patients following abortion, the following symptoms were found, the presence of which before abortion was denied: weakness, tiredness, abdominal pain, leukorrhea, depression, backache, constipation, abnormal bleeding, urinary dysfunction, headache, nervousness, fainting. Changes occurred in the patients' attitude toward the abortion, toward their sexual partners, and toward coitus. A general tendency toward depression was demonstrated. Forty-three per cent had not resumed sexual relations as yet. Of 70 patients who at the time of the abortion had expressed love for their partner, 15 had changed to mixed

emotions or dislike. In 13 cases the sex relationship which had been responsible for the pregnancy had terminated with feelings of dislike on the part of the woman. Of 68 women who had stated in the hospital at the time of the abortion that they found pleasure in coitus, 22 expressed indifference and 10 expressed dislike after return to the home environment.

**L**ow hormone levels and psychologic changes as the result of a therapeutic abortion may be characterized in behavior ranging from a regression of the sexual urge to less well-organized tendencies such as depression, withdrawal from social contacts, self-destructive ideas, hostility toward masculine objects, or a recurrent desire to become pregnant.

Hormones influence sexual and the maternal interest and, conversely, the hormonal level may be affected by the emotional state. It is common knowledge that emotional disturbance can suppress menstruation.

*Grossesse Nerveuse* is a case where a woman firmly believes herself to be pregnant and develops objective symptoms of pregnancy in the absence of it. The dramatic way in which all the symptoms subside when the patient is informed she is not pregnant is amazing.

Spontaneous abortion may occur following emotional shock. In attempting to explain the actual mechanism, the possibility of hyperemia of the uterine vessels must be considered. The increased blood flow to the uterus could lead to hemorrhage into the decidua or cause a premature separation of the placenta.

#### FRIGIDITY AND STERILITY

It has been previously pointed out that not infrequently an abortion may leave the woman with ambivalent or openly hostile feelings directed toward her marital partner. This disinterest in coitus may vary from failure to obtain an orgasm to a general aversion to coitus. There exists a fairly widespread belief among women that conception is possible only after a complete orgasm. Many women remain in a frigid

or semi-frigid state during coitus and, as the result of psychologic and emotional blocking fail to allow their physiologic desire to be expressed. The cause of this blocking in many instances is purely an economic one. "Babies cost too much—think of college and everything." It is true that fear of criticism or ridicule, hostility against the partner, or conflicting love objects are also frequent etiologic factors causing frigidity. The fear of pregnancy stemming from economic distress and financial concern evidencing itself in some type of frigidity must, however, not be underestimated.

One of the sequelae of frigidity may be sterility. A psychogenic resistance to pregnancy can certainly influence the course of conception or pregnancy in an unfortunate way, probably by influencing muscular, circulatory, hormonal, and metabolic processes.

Orr<sup>13</sup> believes that in cases in which women have become pregnant after years of sterility, the emotional change following the adoption or the decision to adopt a child makes psychogenic sterility a probable clinical entity. The influence of psychic factors on hormonal and endocrinologic processes further substantiates such a possibility. Whether the musculature of the uterus is subject to psychic influences or not is still open to debate. Premature labor not infrequently may occur after a sudden fright, so it is assumed that the uterine musculature may possess some reflex activity resulting from emotional excitability.

#### INDICATIONS FOR THERAPEUTIC ABORTION

It is not within the scope of this paper to discuss in detail the many indications for the performance of a therapeutic abortion. Kuder and Finn<sup>10</sup> have made a report based upon the experience of the New York Lying-in Hospital, from September 1932 through December 1943, with 280 pregnancies which were interrupted for therapeutic reasons. Toxemia and cardiac disease accounted for 58.2 per cent of all the interruptions. Pulmonary and urologic disease accounted for 20.7 per cent and neurologic and psychiatric disease, 5.7 per cent. Of pregnancies

interrupted for neurologic and psychiatric reasons, the majority were for manic depressive psychoses; 3 were for epilepsy along with extenuating circumstances, and 3 for far-advanced cases of multiple sclerosis.

The authors reviewed 29 cases of therapeutic abortions performed at the Colorado General and Colorado Psychopathic Hospital between January 1937 and January 1946, and the results are set forth in Table 1.

TABLE 1

Group	Number of Cases	Per Cent
Toxemia . . . . .	6	20.7
Cardiac disease . . . . .	5	17.5
Pulmonary disease . . . . .	4	13.8
Urologic disease . . . . .	3	10.3
Neurologic and psychiatric disease . . . . .	5	17.5
Medical disease . . . . .	2	6.8
Endometritis . . . . .	2	6.8
Carcinoma of the cervix . . . . .	1	3.4
Deformed fractured pelvis . . . . .	1	3.4
Total . . . . .	29	100.0

A therapeutic abortion was performed on the following cases of neurologic and psychiatric disease: (1) grand mal epilepsy with psychopathic personality; (2) obsessive, compulsive ruminative state superimposed upon psychopathic personality coupled with pernicious vomiting of pregnancy; (3) mental retardation with choreo-athetosis; (4) Friedreich's ataxia; and (5) recurrent schizophrenia.

In 1937 the University of Colorado School of Medicine and Hospitals formed an Abortion Committee to handle the discussion and decision of cases presented for consideration for a therapeutic abortion. This committee consists of a professor of medicine, a professor of obstetrics and gynecology, and also a professor of psychiatry.

Each consultant gives his decision on the cases and signs his written opinion. This spread of authority prevents any physician from abusing the procedure or utilizing it for selfish gain; it also protects the individual physician since there is a group opinion.

IN CONSIDERING the indications for therapeutic abortion in neurologic and psychiatric disease, one is at the outset confronted with the complex problem of heredity, genomics, and constitutional factors. Genetic aspects of personality are complex because a personality is a somewhat intangible entity and is not subject to rigid types of yardstick measurement. The age-old controversy of heredity versus environment will not be re-hashed here; however, abnormal personalities with social aberration have been studied from social and economic aspects. Sometimes the degree of social problem presented is most marked in the economic sphere. There is a tendency for low economic status to affect numerous members of the same family.

Morally, it would be gross stupidity in the minds of some for the medical profession to condone therapeutic abortion for economic or sociologic reasons, yet one cannot help but wonder what effect such a policy might be in terms of juvenile delinquency, alcoholism, mental deficiency, suicides, homicides, arrests, and the population of our penal and state institutions. The chief objections to therapeutic abortion for economic reasons would be moral, sociologic and, of course, religious.

The decline of the birth rate is rarely disputed by anyone. The decline is probably more pronounced in the well-to-do families than in poor families. Some eugenicists feel that the superior are not propagating themselves and the inferior are.

Deutsch<sup>7</sup> feels that every woman has the right to achieve or renounce motherhood and that every woman assumes this right emotionally, whether it is legal or not. The increasing entrance of women into social and economic activity has characterized the American economy for several decades. As the feeling of the individuality of the woman and her independence increase, her aversion to uncontrolled child-bearing increases.

In a study of 537 cases of abortion at the Bellevue Clinic Hamilton<sup>8</sup> found that the single, the white, the employed, the native American, and the more highly educated woman was found more frequently in the group who

admitted induced abortion than among those who denied it.

The importance of legitimate and illegitimate pregnancy has played a major role in society. The offspring born out of wedlock has been branded a bastard, a term of cosmic rebuke. This term reflects the vindictive attitude of society in general that the offspring should be shunned and the mother condemned in order to pay for her illicit and secret erotic play. Left to herself, many an unmarried pregnant woman would probably not consider having an abortion inasmuch as the unconscious desire to bear the child and the maternal instinct itself are greater than the feelings of society. Other single masochistic women may utilize an abortion to punish themselves or they may carry a deep-seated, masculine-directed hostility for years.

In discussing the indications for therapeutic abortion in psychiatry, the ever-present concept of constitutional endowment must be mentioned. In the development of a personality, the amount and quality of constitutional endowment must be considered and certainly should be emphasized in any case considered for interruption of pregnancy.

Medicine has added to constitutional thinking that the physiologic organism must be considered as an integrated unit which reacts as a whole and not in parts. The psychobiologic school of thought has done much to disseminate this idea through medical circles. Among the psychoanalysts, Franz Alexander of Chicago<sup>1</sup> has emphasized that for any analytical procedure to be successful it must deal with the total personality. Research along psychosomatic lines as performed by Dunbar<sup>6</sup> re-emphasizes the need to include the total over-all personality.

Myerson<sup>12</sup> made a comprehensive study on the inheritance of mental diseases. The transmission of mental disease or the inheritance of insanity is still somewhat ill-defined and a subject of discussion and debate. Strecker and Ebaugh<sup>15</sup> point out that heredity has been over-emphasized in evaluating mental disease. It has been shown that mental illness is only slightly higher in families with positive psy-

chiatric histories than that of the general population as a whole.

Lennox<sup>11</sup> has stated that the underlying condition of epilepsy is heritable and has found a similarity in wave patterns of electroencephalograms of members of the same family; however, less than one-fifth of patients have family histories of epilepsy. With the advent of dilantin, tridione, and the massive amount of research now being carried on with anticonvulsant drugs, the consideration of therapeutic abortion in idiopathic epilepsy hardly seems quite feasible.

Huntington's chorea is definitely known to be due to a degenerative process in the brain and is inherited as a Mendelian dominant character. It may be considered as an indication for therapeutic abortion.

There are apparently still some who dispute the etiologic significance of heredity in mental deficiency; however, it is usually considered a mental disease in which abortion may be genetically indicated.

ONE of the clinical "wastebaskets" of psychiatric nosology and therapy is the psychopathic personality. Some authors feel that the psychopath is an individual inadequately equipped from birth; however, an etiology of constitutional deficiency remains to be proven. A psychopath externalizes his aggression and works it out on the environment. Usually at an early age, abnormal emotional reactions have occurred which have cemented his early dislike of the world in general. Psychopathy appears to become more and more a socio-characterological disease rather than a constitutional one. At the present time there is no indication for performing therapeutic abortion in psychopathy *per se*. Toxic psychoses due to alcohol, drugs, or other exogenous toxins are rarely, if ever, an indication for therapeutic abortion unless the pregnancy threatens the life of the mother.

There exist very few, if any, psychiatrists who are so partial to their work that they would feel a therapeutic abortion is indicated in any

of the psychoneurotic reaction types. In a certain few selected cases of recurrent schizophrenia in which the illness is of short duration and mild depth, therapeutic abortion may at times be indicated in order to soften the environmental stress as much as possible.

The mode of inheritance in the manic-depressive psychoses is still undetermined, but it would appear to be more hereditarily determined than the other major reaction types. Again, then in certain chosen and selected cases of manic-depressive psychoses, the interruption of pregnancy may be advisable owing to the inability of the patient to care for the child and the problems inherent in management, confinement, and labor. In pregnancy occurring in the single young woman with resultant self-guilt and self-depreciation, coupled with strong energetic suicidal drives, the interruption of pregnancy should be carefully considered and each case, of course, based on its own merits. Buchler<sup>4</sup> feels that it is beyond dispute that spinal and cerebral tumors, syringomyelia, progressive spinal muscular atrophies, hereditary chorea, lateral sclerosis, and severe forms of epidemic encephalitis form absolute indications for abortion.

#### SEXUAL EDUCATION

Psychiatric reflections on the problem of abortion must, of course, include to some degree the problem of sexual education. Many of our present-day feelings regarding sexual matters are still throwbacks to grandmother and her puritanical turned-up nose; whenever sex reared its ugly head, it was pushed off into the corner to lie hidden, cloaked in all its mystery and darkness. Is it possible that our present-day thinking regarding abortion is still pedantic and locked up in logic-tight compartments?

The family pattern and the parent-child relationships are the nuclei on which personality structure is based. It is our challenge and our duty as physicians in one, if not the most important, branch of public health and preventive medicine, to see that proper parental attitudes and child-parent relationships are established.

Daily one meets unbelievable ignorance and naïveté with regard to sexual matters that have produced warped personalities and distorted philosophies of life.

It is easy for the parent to push the responsibility for proper sexual education to the school system, but too frequently the schools are not prepared to accept the responsibility, and, still too frequently, maladjusted teachers feel that sex is a dirty and nasty topic and will have nothing to do with it. Is it not odd that in our present-day school curriculum up to and including high school, courses designed to aid one in meeting the emotional problems of living are not included? World War II with its psychiatric rejection rates and neuropsychiatric casualty lists certainly points to, among other things, a drastic revision in our educational system of today.

THE importance of an hour or two spent in premarital counseling may save years of emotional distortion. A few minutes' explanation to the adolescent girl on the eve of her menarche, or to the adolescent boy on the subject of nocturnal emissions may change the pattern of their future adjustment. It is well-known that the parents' personalities, their capacity for love, their acceptance or rejection of sexuality, influence the children's identification and their subsequent psychosexual adjustment. Proper education regarding birth control is, of course, fundamental. Some young married couples start their lives together with a very firm feeling that to have offspring is to admit openly to the world that they are unable to curb their basic instinctive urges and are hanging economic millstones around their necks that will interfere with their own narcissistic gratification of life for years to come.

Childhood is the formative period of life during which the person should learn how to organize all his basic and instinctive urges in a way satisfactory to himself and society. If the child receives little, if any, training regarding sex from his parents or if he receives faulty information from outside sources, then the sexual



expression carried forth into adult life may be distorted and bizarre. If parental attitudes are faulty, they result in serious interference with the usual normal course of psychosexual development.

Adequate and proper sexual education by parents and a well-balanced comprehensive cur-

riculum of sex education in the public school system will go a long way toward establishing a proper outlook on life, maturity, and marriage with its problems and gratifications.

The medical profession must face the abortion problem with realism and a positive attitude as to the complexity of the factors involved.

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*Courtesy, Norlyst Art Gallery*

**ANESTHESIA**, by Leonard Lionni. Born in Amsterdam, in 1910, Lionni lived successively in Holland, Belgium, France, Switzerland and Italy. He graduated from the University of Genoa with a Ph. D. in Economics, but art soon became his principal interest. In 1939 Lionni moved to the United States and became a citizen of this country. He now lives in Philadelphia.

# Use of Enterogastrone in Management of Peptic Ulcer

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ENTEROGASTRONE is a humoral agent derived from the intestinal mucosa. Up to the present time it has not been obtained in pure crystalline form, but it can be identified by its primary physiologic action of inhibiting the motor and secretory activity of the stomach. The possibility of the existence of such a gastric inhibitory substance has been suspected for a great many years. As long ago as 1886 Ewald and Boas<sup>1</sup> demonstrated that the ingestion of neutral fat inhibits gastric secretion. It was later proven that this effect is elicited from the small intestine and not the stomach.<sup>2</sup> More recently it has been shown<sup>3</sup> that the ingestion of fat inhibits not only gastric secretory activity, but also gastric motility, and that this inhibition of motility is humoral in nature. The concept of the humoral mechanism of this inhibition is a comparatively new one, but it has been adequately proven by the demonstration that the motility of autotransplanted gastric pouches (completely denervated) is inhibited by the introduction of fat into the main stomach. That fact that the inhibition of gastric secretion following the ingestion of fat is also humoral in nature has been proven by the same method.

The next step in the development of enterogastrone was to find the humoral agent. The first clue to its identification was provided by the observation that cholecystokinin administered in large quantities inhibited gastric secretion.<sup>4</sup> Cholecystokinin is a humoral agent that activates the gallbladder, and since it is prepared from an extract of the small intestine, several extracts were prepared from the mucosa of the small and large intestines of dogs,<sup>5</sup> and it was found that such extracts free of cholecystokinin activity inhibited both the secretory and the motor activity of the stomach. Because of the derivation of this material from the intestine it was named enterogastrone. Later the extract was purified and made more potent, and a "dog unit" was defined on the basis of the degree of inhibition of gastric secretion in dogs.<sup>7</sup>

In view of the long-known relationship between gastric acidity and peptic ulcer in man, the therapeutic possibilities of enterogastrone were early recognized. However, prior to attempting its use in man it was necessary to demonstrate the effect of this substance in experimental ulcers in animals. One form of the experimental approach to human peptic ulcer is the jejunal ulcer that can be produced in dogs by permitting the acid gastric juice to

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come directly and continuously into contact with the sensitive mucosa of the jejunum. This has been accomplished by an anastomotic operation proposed by Mann and Williamson,<sup>8</sup> and animals so prepared are known as Mann-Williamson dogs. In such animals a jejunal ulcer will develop in more than 98 per cent of the cases.<sup>9</sup> It was first demonstrated by Hands and others<sup>10</sup> that when enterogastrone is administered parenterally to Mann-Williamson dogs, jejunal ulcers do not develop. It was shown not only that enterogastrone prevented the formation of jejunal ulcers during the period of therapy with enterogastrone, but also that the use of this substance provides some degree of "immunity" against the development of ulcer. Animals so treated failed to develop a jejunal ulcer long after therapy was discontinued.<sup>11</sup> The mechanism of this protective action is unknown.

In applying these facts to the therapeutic use of enterogastrone in human peptic ulcer, several points must be kept in mind. First of all,

there is no certainty that the Mann-Williamson ulcer in dogs can be justifiably identified with the spontaneous gastric or duodenal ulcer in man. Perhaps it is more closely allied to the marginal jejunal ulcer that occasionally follows anastomotic gastric surgery. Recent and interesting data relevant to this problem are provided by the fact that gastric and duodenal ulcers have been unintentionally produced in patients during desensitization with histamine.<sup>12, 13</sup> In all respects these resembled the spontaneous human peptic ulcer. On the other hand, enterogastrone fails to prevent histamine ulcer in dogs.<sup>14</sup> Thus, we have a type of ulcer—quite analogous to spontaneous ulcer—that has been produced in man, but against which enterogastrone provides no protection. A second factor is that enterogastrone can be prepared only as impure extract so that one is unable to be certain that its activity is due to a single substance or to a mixture of two or more substances. In the third place, a very important consideration in determining the value of enterogastrone in treating peptic ulcer is the fact that both the gastric and duodenal ulcers during their natural history undergo spontaneous remissions and exacerbations. This accounts for the many forms of therapy that have been advocated and provides an important stumbling block in critically evaluating the specific efficacy of any single agent such as enterogastrone.

From a critical point of view, it appears to us that any agent to be considered of *fundamental* therapeutic value in peptic ulcer must fulfill two qualifications: It must shorten the duration of an acute exacerbation, and it must prevent the recurrence of either gastric or duodenal ulcer, at least during the period of its administration.

**K**EEPING these facts in mind we may now consider the results of enterogastrone therapy in man. The first report of such a clinical trial was reported in 1943<sup>11</sup> and has recently been amplified by Greengard and his co-workers.<sup>15</sup> Fifty-eight patients were treated with in-

intramuscular enterogastrone. Of these, 51 had duodenal ulcers, 4 had postoperative jejunal ulcers, 2 had both a gastric and a duodenal ulcer, and 1 had a gastric ulcer. Twenty-six patients received 6 injections weekly and 32 received 3 injections each week. Treatment was carried out for 6 to 12 months, and the authors reported that a large number of the cases had no recurrences during and after therapy and that there was improvement in the radiographic appearance of the upper gastrointestinal tract. They felt from their results that it was admissible to state that in their 58 cases the parenteral administration of enterogastrone was not without beneficial consequences.

UP TO the present time there have not appeared in this country any other reports on the clinical use of *parenteral* enterogastrone or any reports on the clinical use of *oral* enterogastrone. However, for several years results of the use of crude extracts of duodenal mucosa and submucosa by oral administration in peptic ulcer in man have been published, and quite recently several European investigators<sup>16, 17</sup> have reported on the use of such crude extracts both orally and parenterally. These results are difficult to evaluate because in most instances the extracts were neither adequately purified nor standardized. In addition, the extracts employed have varied from investigator to investigator and, in many instances, were mixed with extracts of the gastric mucosa. Of historical interest is the Rivers<sup>18</sup> report giving encouraging results obtained from the oral use of crude duodenal extracts in 50 patients. These reports all raise the problem of the possible use of enterogastrone orally in man for peptic ulcer. Apparently, oral administration of this material protects Mann-Williamson dogs against jejunal ulcers.<sup>9</sup> Likewise, it has been recently demonstrated<sup>19</sup> that large quantities of hog stomach and duodenal preparations protect dogs against cinchophen ulcers. However, there has been no clinical data on the oral use of the purified preparation of enterogastrone in man.

Our own experience with the clinical use



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of enterogastrone has involved its use in gastric and duodenal ulcer, administered both orally and intramuscularly. It was felt that more information could be obtained from a careful clinical roentgenologic and laboratory study of a comparatively small group of patients followed carefully than from its indiscriminate use in every case of peptic ulcer. Three criteria were established for the selection of patients as suitable for treatment with enterogastrone. First of all, we required a long history of recurrent exacerbations of peptic ulcer. Actually, most of the patients treated had an average of 2 yearly recurrences for a period of at least 5 years. Secondly, patients were selected on the probability of their cooperation for long-continued observation and follow-up. Thirdly, with one exception, we did not undertake enterogastrone therapy in those cases where complications, particularly pyloric obstruction, were present in the patient.

Selected on the basis of these criteria, we have treated up to the present time 31 cases

TABLE 1

FIFTEEN CASES OF PEPTIC ULCER TREATED WITH ORAL ENTEROGASTRONE

Case	Diagnosis*	Duration of Symptoms (Years)	Daily Dosage (Grams)	Duration of Therapy (Months)
1.....	DC	17	8 0	13
2.....	D	15	16.0	6
3.....	D	16	8 0	8
4.....	D	12	16.0	4
5.....	D	8	16 0	4
6.....	D	20	16 0	2½
7.....	G	11	16 0	8
8.....	DC	5	16.0	4
9.....	D	6	16 0	4
10.....	DC	21	16 0	6
11.....	DC	10	8 0	9
12.....	D	10	8 0	11
13.....	D	6	16.0	4
14.....	D	8	16.0	1½
15.....	D	3	16 0	1½

\*D, duodenal bulb deformity; DC, duodenal ulcer crater; and G, gastric ulcer.

with enterogastrone. The essential data on these cases is presented in *Tables 1 and 2*. It will be seen that 28 cases had duodenal ulcer, 1 had a gastric ulcer, 1 had both duodenal and gastric ulcers, and 1 had a marginal jejunal ulcer subsequent to a partial gastric resection. Fifteen cases were treated by the oral administration of the drug, and 16 were treated by the parenteral route. When given orally, the dosage varied from 8 to 16 gm. daily. At present we usually favor the higher dosage. The intramuscular dose was usually 200 mg. given daily for 6 days of each week. During the initial 3 to 4 weeks of treatment the patient was maintained on a modified Meulengracht diet, antacid medication, and antispasmodics as necessary to control symptoms. Later an effort was made to discontinue all medication except enterogastrone and to broaden the diet to include nearly all foods, except possibly a few items which the patient felt sure elicited symptoms. It was not always possible to accomplish these ends, particularly in regard to diet, because many of our patients had been on restricted diets for so long a time that they actually feared to partake of a general diet. In addition, persistence of symptoms in some cases required a restricted diet and antacid medication.

TABLE 2

SIXTEEN CASES OF PEPTIC ULCER TREATED WITH PARENTERAL ENTEROGASTRONE

Case	Diagnosis*	Duration of Symptoms (Years)	Daily Dosage (Milligrams)	Duration of Therapy (Months)
16.....	DC	21	200	4
17.....	D	8	200	6
18.....	D	17	200	5
19.....	D	23	200	¾
20.....	D	15	200	4
21.....	J	9	200-400	7
22.....	D	15	200	3½
23.....	D	10	200	8
24.....	D	20	16 gm.†	3
25.....	D	18	200	4½
26.....	D	9	200	1½
27.....	D	6	200‡	4
28.....	DG	15	16 gm.	2
29.....	D	12	200	4
30.....	D	15	200	4
31.....	D	20	200	7
32.....	D	20	200	3

\*D, duodenal bulb deformity; J, jejunal ulcer; G, gastric ulcer; and DC, duodenal ulcer crater.

†Changed from oral to parenteral after three months' therapy at patient's request.

‡Changed to oral because of persistent malaise associated with use of parenteral preparation.

In no instance was oral enterogastrone responsible for any untoward reactions. On the other hand, intramuscular enterogastrone caused a local reaction characterized by pain and tenderness at the site of injection in every case. This local reaction was often quite severe and usually occurred during the first 10 to 14 injections, but disappeared thereafter and failed to recur. The intramuscular drug also was responsible for systemic reactions in at least 2 instances, and, possibly 4. In 1 case, the systemic reaction occurred in an asthmatic and was characterized by persistent headaches. Concomitant use of pyribenzamine relieved the headache and made it possible to continue the drug. In another instance, general malaise occurred during the parenteral administration of enterogastrone, and only in this case was it necessary to discontinue the injections. In 2 other cases chills and fever were reported as ensuing after the parenteral administration of enterogastrone at the patient's home. This febrile reaction did

not recur subsequently when the patients were observed by us at a later date in the hospital, even though the injections were continued.

We have already pointed out some of the difficulties in evaluating clinical results in the therapy of peptic ulcer. Improper selection of cases may also be a factor such as in Case 19 where organic obstruction was apparently present and in Case 18 where psychogenic situational factors were of paramount importance in producing symptoms. Likewise, it must be remembered that often the patient continued to complain of vague upper gastrointestinal discomfort which was not entirely characteristic of a typical recurrence. However, in such cases one should not conclude that the patient

was necessarily an example of successful therapy as far as enterogastrone is concerned. Since treatment has been carried out for periods of three weeks to thirteen months, in many instances our period of observation is not as yet long enough to come to definite conclusions regarding recurrence rate. Considering all these factors, we have attempted to classify the clinical course of our treated cases during and subsequent to enterogastrone therapy. See *Tables 3 and 4* for this classification.

It will be noted that of 16 cases treated orally, 2 subsequently required surgery, 1 had a definite recurrence of his peptic ulcer clinically and radiographically, and 1 had persistent vague upper gastrointestinal symptoms. Twelve cases had a satisfactory course symptomatically. However, 1 case in this last group (Case 7) with a gastric ulcer had persistent symptoms for six months after treatment started. This was the time required for the radiographic healing of the ulcer, and one would be certainly justified in criticizing our inclusion of this case in the successful group. Of the 15 cases treated parenterally, 2 required subsequent surgery, 3 had definite recurrence of clinical symptoms, 2 had persistence of vague upper gastrointestinal symptoms, and in 8 cases the course was entirely satisfactory.

TABLE 3

CLINICAL COURSE OF FIFTEEN CASES OF PEPTIC  
ULCER TREATED WITH ORAL ENTEROGASTRONE

<i>Required surgery</i>	
Case 4. Persistent symptoms .....	2
Case 10. Developed obstruction .....	
<i>Definite clinical recurrence</i>	
Case 12. Clinical and radiographic evidence of exacerbation after ten months.....	1
<i>Persistent vague symptoms</i>	
Case 11. Vague epigastric distress ? pylorospasm .....	1
<i>Satisfactory control of ulcer</i> .....	12

TABLE 4

CLINICAL COURSE OF SIXTEEN CASES OF PEPTIC ULCER  
TREATED WITH INTRAMUSCULAR ENTEROGASTRONE

<i>Required surgery</i>	
Case 19. Persistence of obstruction initially present .....	2
Case 22. Developed obstruction .....	
<i>Definite clinical recurrence</i>	
Case 28. Duodenal deformity at start. Crater appeared after two months' therapy.....	3
Case 26. Persistence of symptoms.....	
Case 31. Persistence of symptoms. Gastric ulcer appeared .....	
<i>Persistence of vague symptoms</i>	
Case 18. ? pylorospasm .....	2
Case 27. Pylorospasm .....	
<i>Satisfactory control of ulcer</i> .....	

THE most striking therapeutic result was obtained in Case 21. This patient is a 44-year-old male. He was first seen at the University Hospital in 1938 because he had a severe anemia. At that time a "duodenal ulcer of long standing" was found by x-ray. He was given an antacid and placed on a restricted diet. He was not seen again until December 1946, when he revealed that characteristic ulcer symptoms recurred in September 1940, in association with frequent tarry stools. A partial gastric resection was carried out at another hospital at that time. There were then no symptoms for three years, postoperatively. However, from 1943 to December 1946 there were recurrent symptoms and at least 3 episodes of gastrointestinal bleeding associated with chronic persistent anemia. On

TABLE 1

FIFTEEN CASES OF PEPTIC ULCER TREATED WITH ORAL ENTEROGASTRONE

Case	Diagnosis*	Duration of Symptoms (Years)	Daily Dosage (Grams)	Duration of Therapy (Months)
1 . . . . .	DC	17	8 0	13
2 . . . . .	D	15	16.0	6
3 . . . . .	D	16	8 0	8
4 . . . . .	D	12	16.0	4
5 . . . . .	D	8	16 0	4
6 . . . . .	D	20	16 0	2½
7 . . . . .	G	11	16 0	8
8 . . . . .	DC	5	16.0	4
9 . . . . .	D	6	16 0	4
10 . . . . .	DC	21	16 0	6
11 . . . . .	DC	10	8 0	9
12 . . . . .	D	10	8 0	11
13 . . . . .	D	6	16.0	4
14 . . . . .	D	8	16.0	1½
15 . . . . .	D	3	16 0	1½

\*D, duodenal bulb deformity; DC, duodenal ulcer crater; and G, gastric ulcer.

with enterogastrone. The essential data on these cases is presented in *Tables 1 and 2*. It will be seen that 28 cases had duodenal ulcer, 1 had a gastric ulcer, 1 had both duodenal and gastric ulcers, and 1 had a marginal jejunal ulcer subsequent to a partial gastric resection. Fifteen cases were treated by the oral administration of the drug, and 16 were treated by the parenteral route. When given orally, the dosage varied from 8 to 16 gm. daily. At present we usually favor the higher dosage. The intramuscular dose was usually 200 mg. given daily for 6 days of each week. During the initial 3 to 4 weeks of treatment the patient was maintained on a modified Meulengracht diet, antacid medication, and antispasmodics as necessary to control symptoms. Later an effort was made to discontinue all medication except enterogastrone and to broaden the diet to include nearly all foods, except possibly a few items which the patient felt sure elicited symptoms. It was not always possible to accomplish these ends, particularly in regard to diet, because many of our patients had been on restricted diets for so long a time that they actually feared to partake of a general diet. In addition, persistence of symptoms in some cases required a restricted diet and antacid medication.

TABLE 2

SIXTEEN CASES OF PEPTIC ULCER TREATED WITH PARENTERAL ENTEROGASTRONE

Case	Diagnosis*	Duration of Symptoms (Years)	Daily Dosage (Milligrams)	Duration of Therapy (Months)
16 . . . . .	DC	21	200	4
17 . . . . .	D	8	200	6
18 . . . . .	D	17	200	5
19 . . . . .	D	23	200	¾
20 . . . . .	D	15	200	4
21 . . . . .	J	9	200-400	7
22 . . . . .	D	15	200	3½
23 . . . . .	D	10	200	8
24 . . . . .	D	20	16 gm.†	3
25 . . . . .	D	18	200	4½
26 . . . . .	D	9	200	1½
27 . . . . .	D	6	200‡	4
28 . . . . .	DG	15	16 gm.	2
29 . . . . .	D	12	200	4
30 . . . . .	D	15	200	4
31 . . . . .	D	20	200	7
				3

\*D, duodenal bulb deformity; J, jejunal ulcer; G, gastric ulcer; and DC, duodenal ulcer crater.

†Changed from oral to parenteral after three months' therapy at patient's request.

‡Changed to oral because of persistent malaise associated with use of parenteral preparation.

In no instance was oral enterogastrone responsible for any untoward reactions. On the other hand, intramuscular enterogastrone caused a local reaction characterized by pain and tenderness at the site of injection in every case. This local reaction was often quite severe and usually occurred during the first 10 to 14 injections, but disappeared thereafter and failed to recur. The intramuscular drug also was responsible for systemic reactions in at least 2 instances, and, possibly 4. In 1 case, the systemic reaction occurred in an asthmatic and was characterized by persistent headaches. Concomitant use of pyribenzamine relieved the headache and made it possible to continue the drug. In another instance, general malaise occurred during the parenteral administration of enterogastrone, and only in this case was it necessary to discontinue the injections. In 2 other cases chills and fever were reported as ensuing after the parenteral administration of enterogastrone at the patient's home. This febrile reaction did

not recur subsequently when the patients were observed by us at a later date in the hospital, even though the injections were continued.

We have already pointed out some of the difficulties in evaluating clinical results in the therapy of peptic ulcer. Improper selection of cases may also be a factor such as in Case 19 where organic obstruction was apparently present and in Case 18 where psychogenic situational factors were of paramount importance in producing symptoms. Likewise, it must be remembered that often the patient continued to complain of vague upper gastrointestinal discomfort which was not entirely characteristic of a typical recurrence. However, in such cases one should not conclude that the patient

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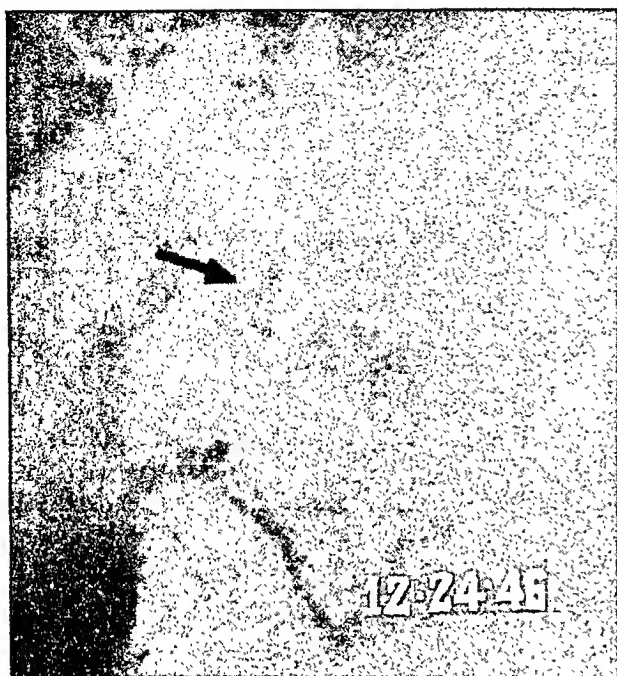


Figure 1. Upper gastrointestinal x-rays in Case 21. Marginal ulcer present 12/24/46. Complete healing by 1/14/47.

December 23, 1946, he was admitted to the University Hospital. At that time the physical examination revealed a pale, undernourished male (weight, 131.5 pounds; height, 68.5 inches). Hemoglobin was 11.1 gm. and the red cell count 5,200,000. Stool was positive for occult blood. A gastrointestinal x-ray made on December 24, 1946, revealed a "marginal ulcer following gastro-jejunostomy" (*Figure 1*). On this date enterogastrone was started, 200 mg. intramuscularly daily. This was increased to twice daily December 30, 1946, and continued until January 28, 1947, when it was decreased to once daily and has been continued at this dosage up to the present. In addition to enterogastrone, the patient was given a bland diet and ferrous sulfate. Repeat x-ray on January 14, 1947, revealed complete healing of the ulcer (*Figure 1*). At this time the patient was asymptomatic, weight was 135 pounds, stools were negative for occult blood, and hemoglobin was 12.0 gm. He was discharged January 29, 1947, and has remained asymptomatic to the present. Hemoglobin is now 14.0 gm. and his weight is 139 pounds at this point.

Another instance of a less striking but definitely successful result associated with enterogastrone therapy is exemplified by Case 1. This patient is a 49-year-old male. He was originally seen at the University Hospital in May 1946, complaining of epigastric discomfort which occurred two to three hours after meals and was relieved by food or alkali. He had had this difficulty since 1929, but had been able to control his symptoms moderately well by restriction of diet, frequent feedings, and the use of sodium bicarbonate. There were many recurrent exacerbations of symptoms, particularly in the fall and winter. During the summer the patient was generally symptom free.

In 1939 an x-ray diagnosis of duodenal ulcer was first made. In December 1944, he had a severe hematemesis requiring hospitalization. Since that time symptoms had been more severe and persistent with occasional recurrent episodes of nausea and vomiting lasting a few days to 2 weeks. When first seen at the University Hospital (May 19, 1946) he appeared well nourished. There was epigastric tenderness. X-rays (May 10, 1946) revealed deformity of



Figure 2. X-rays in Case 1. No marked change from 5/10/46 to 11/29/46 in spite of patient's becoming asymptomatic.

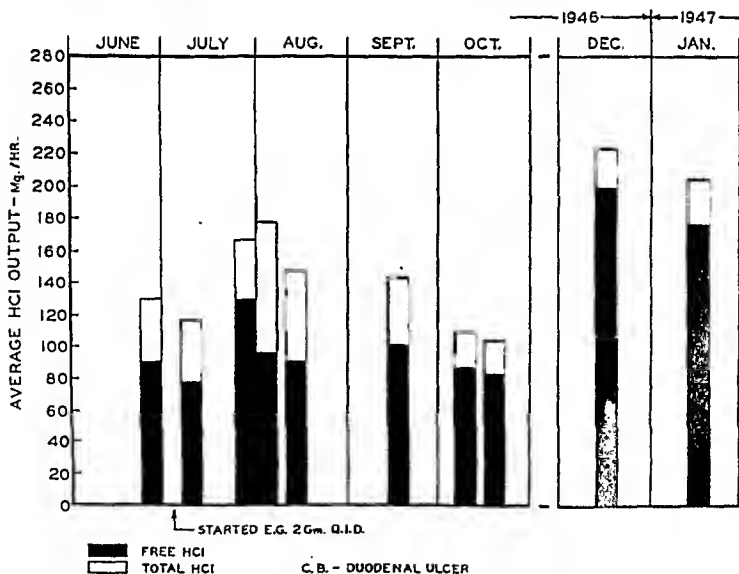


Figure 3. Variations in output of hydrochloric acid during oral therapy with enterogasttrone (Case 1).

the duodenal bulb and evidence of a small crater (*Figure 2*). He was placed on a modified Meulengracht diet, and given atropine and oral enterogastrone, 8 gm. daily. Patient became asymptomatic after 2 weeks, when the Meulengracht diet was discontinued. He remained asymptomatic until September 1946, when he had a one-day episode of nausea and vomiting. X-rays at this time (September 17, 1946) revealed marked deformity of the duodenal bulb, but no crater was present (*Figure 2*). Since September the patient has continued essentially asymptomatic. He has gained weight and has lost no time from work. X-rays on November 29, 1946, revealed only duodenal deformity shown in *Figure 2*.

This case is of considerable interest because of at least two points. First of all, as *Figure 2* illustrated, the x-ray appearance of the duodenal deformity is essentially unchanged in spite of nearly complete symptomatic relief. We have found this to be generally true where the diagnosis of peptic ulcer is originally based on the occurrence of the ulcer symptom-complex and the x-ray finding of only duodenal bulb deformity. This is important because in such instances one cannot generally use objective x-ray observation as a criterion of the efficacy of enterogastrone. In cases of gastric ulcer or where a duodenal ulcer crater is present the situation is different. A second point of interest in Case 1 is the absence of any change in gastric secretion and motility in spite of symptomatic relief. As indicated in *Figure 3*, frequent observations of gastric acidity revealed no change from the period of active symptoms to the time when no symptoms were present. The same thing is true for gastric motility. This has been found to be generally true in our patients, so that whatever effect enterogastrone may have had in relieving symptoms cannot be explained on the basis of the effect of enterogastrone on either the secretory or the motor activity of the stomach.

#### SUMMARY

1. Enterogastrone is a humoral agent which

is derived from the intestinal tract and causes an inhibition of secretory and motor activity of the stomach in experimental animals.

2. Enterogastrone intramuscularly—and possible orally—protects Mann-Williamson dogs against jejunal ulcers, but fails to protect the dogs against histamine ulcers.

3. Enterogastrone administered to patients orally in doses of 8 to 16 gm. daily produces no untoward effects. When given intramuscularly, it nearly uniformly causes a transient local reaction at the site of injection and occasionally a mild generalized systemic reaction.

4. Enterogastrone given either orally or intramuscularly over long periods of time to patients with gastric or duodenal ulcer may have some beneficial effect in decreasing the incidence of exacerbations of the disease.

5. Final conclusions regarding the value of enterogastrone must await (1) further purification of the agent, and (2) the careful observation over a period of years by several different investigators of patients with peptic ulcer treated with enterogastrone.

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# Acute and Chronic Pancreatitis

MOSES BEHREND\*

PHILADELPHIA

**A**CUTE pancreatitis curiously seems to occur in periodic cycles. The real cause of acute pancreatitis is unknown. The precipitating cause, however, is supposed to be an admixture of the pancreatic and biliary juices due to biliary reflux. If this is true, there should be many more cases of acute pancreatitis reported. A hematogenous infection may also cause acute pancreatitis. It is a well-known fact that gourmands and those who drink heavily of alcoholic liquors are especially subject to acute pancreatitis.

**Symptoms**—Attacks of acute pancreatitis occur with extreme suddenness. There is no acute abdominal pain that can compare with its intensity. The area of the pain is general, usually not localized. The rigidity of the abdomen is boardlike, hard, and nonresistant. The slightest touch causes greater tenderness. This diffuse pain remains for several hours until relief is afforded by large doses of morphine. The fact that large doses of morphine are required to relieve the pain often helps to make a differential diagnosis between a ruptured peptic ulcer and acute pancreatitis.

The serum amylase test is the most valuable

method in formulating a diagnosis of acute pancreatitis. In this condition the serum amylase may reach 500 to 3000 units as compared to a normal of 60 to 180 units. Considerable dependence can be placed upon an increase of the serum amylase values in from twelve to twenty-four hours.

**Treatment**—In the past few years much emphasis has been laid upon delayed operation for acute pancreatitis. There is no question that if a positive diagnosis can be made—and this can be confirmed largely now by the amylase test—a delayed operation is far superior to an emergency operation. The mortality of operating upon acute pancreatitis as an emergency is appalling. Results are excellent if one delays operation for at least a week or ten days. Similar conditions hold in cases of acute cholecystitis where delayed operations are preferable to an emergency type of procedure. There is some resemblance in the resolution of this type of inflammation in these two related organs, namely, the gallbladder and the pancreas.

## CHRONIC PANCREATITIS

Disturbances in the right upper quadrant and epigastric regions may be due to chronic pancreatitis. The cause of chronic pancreatitis

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is not known. Repeated mild attacks of acute pancreatitis may be a factor. In certain cases there may be some relationship between pancreatic fibrosis in infancy and chronic pancreatitis. The majority of cases encountered have no evident causative factor.

*Symptoms*—The symptoms of chronic pancreatitis vary with the stage of the disease. In mild inflammatory conditions the intensity and exacerbation of pain is less. The pain may simulate exactly that experienced in cholelithiasis. Jaundice may or may not accompany these phenomena. The intensity of jaundice depends also on the state of inflammation of the pancreas. Jaundice usually becomes more intense after the exacerbations of pain. After the attack the jaundice gradually disappears or may remain in a very slight form, with the yellow-tinged conjunctiva being the only evidence of obstruction that remains. In a few cases no jaundice is present at all in those suffering from chronic pancreatitis. Indiscretions in diet may

precipitate attacks similar to those found in disease of the bile passageways.

Laboratory tests are of little value. The amylase test so important in acute pancreatitis is of practically no value in the chronic type of infection.

*Diagnosis*—It is necessary to make a differential diagnosis between chronic pancreatitis, cholelithiasis, and choledocholithiasis. In cases harboring stones in the gallbladder or common duct or both, the x-ray is helpful. A poorly functioning gallbladder with shadows of stones is indicative of gallbladder disease. X-ray of the pancreatic region reveals nothing unless there are calcareous deposits in this area.

Since there are no specific symptoms or laboratory tests, operation must be considered in the final analysis and disposition of the case. Even when the abdomen is open it is not easy to differentiate between chronic pancreatitis and cancer of the pancreas. One must develop a fine sense of touch to recognize by palpation alone the difference between these two conditions. The degree of hardness and the intensity of the jaundice may often be a great help in coming to a conclusion.

When great difficulty is encountered, a biopsy is important. This test was of great importance in a patient in whom there was complete obstruction of the common duct due to chronic pancreatitis. In other cases where obstruction was incomplete, a biopsy also differentiated between chronic pancreatitis and cancer of this organ.

**I**N the course of an operation for gallbladder disease the pancreas should be palpated. This is especially important in patients who do not have cholelithiasis. The removal of the gallbladder where stones are absent only adds more discomfort later. If no stones are found, the gallbladder should be carefully examined for tumors within its walls. Tumors within the gallbladder are not common. They can usually be felt through the walls of the gallbladder. This can be illustrated by a recent case in which an operation was performed; dis-

seminated carcinomatous tumors were found within the gallbladder and one was found in the common duct (*Figure 1*). All the symptoms incident to gallstone colic were experienced by the patient. It was impossible to arrive at a diagnosis because the symptoms were those of cholelithiasis or pancreatitis.

*Type of Operation*—An external drainage operation of the common duct or gallbladder should never be performed if an internal anastomosis can be made between the hollow viscera and the bile passageways. After a cholecystostomy or a choledochostomy bile will continue to flow externally as long as the patient lives, provided the obstruction continues to persist. Thirty-five years ago surface drainage operations were very popular, but with the refined technic that followed, it became evident that the anastomoses advocated below are far superior to any other type of operation. The anastomosis of the bile passageways with the hollow viscera consists of a cholecystoduodenostomy, cholecystogastrostomy, or cholecystojejunostomy.

When the common duct is used, we may perform a choledochoduodenostomy, choledochogastrostomy, or choledochojejunostomy (*Figure 2*). It has always been my rule to use that portion of the intestinal tract adjacent to the bile passageways. If it is easier to anastomose the stomach to the gallbladder or common duct, that is the structure which is used (*Figures 3 and 4*). Although it is more logical to anastomose the gallbladder and common duct to the duodenum and jejunum, the patient never has any prolonged distress if the stomach is anastomosed to these structures. The danger of infection of the liver which has been of much concern for many years has never deterred me from using the stomach, duodenum or jejunum, because in my experience this occurs very infrequently.

The operation of pancreaticoduodenectomy should be reserved for those cases in which total obstruction is found due to chronic pancreatitis, carcinoma, or calcareous deposits in the pancreas. When a complete benign obstruction exists, the common duct is isolated from its



Figure 1. Multiple implants of carcinoma of the gallbladder. Diagnosis difficult. Symptoms simulated cholelithiasis or chronic pancreatitis.

bed, the distal end is ligated, and with the proximal end, an end-to-side anastomosis is performed to the stomach, duodenum, or jejunum (*Figure 5*). These short-circuiting operations have been employed for a decade with benefit to the patient. The history of ten cases has been reported recently.\* All recovered except one. He was a man thirty-one years old, with incomplete obstruction of the common duct due to chronic pancreatitis. Three weeks after a choledochoduodenostomy, he died from

\*Printed in the Archives of Surgery.

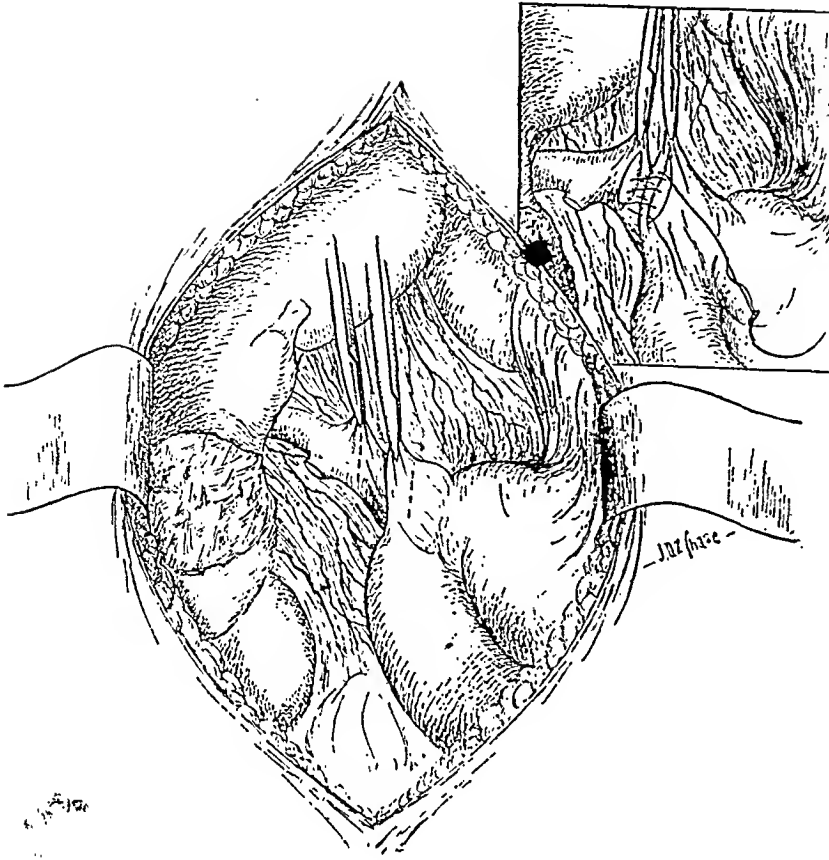


Figure 2. Illustration shows the technic of a lateral cholecystogastrostomy. The same method may be used in performing a choledochoduodenostomy.

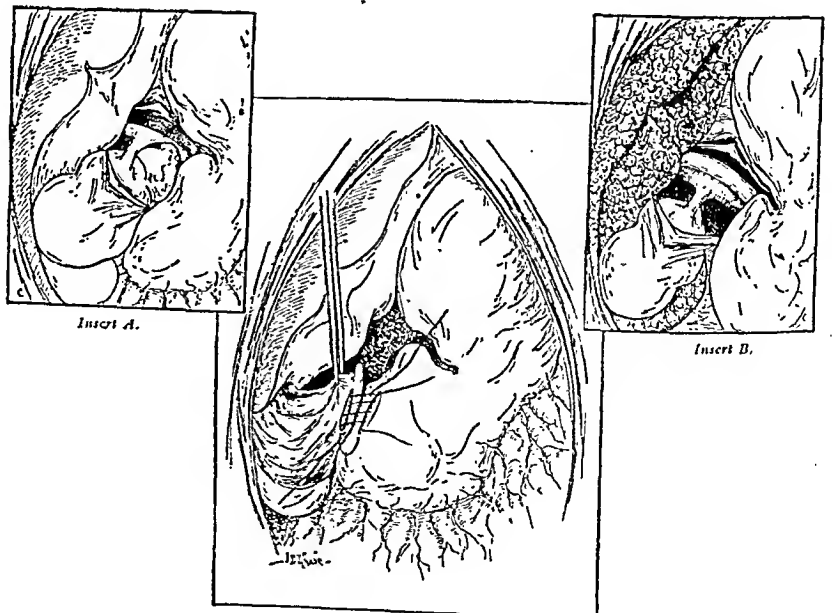


Figure 3. Anastomosis of the stomach to the gallbladder. (Cholecystogastrostomy.)

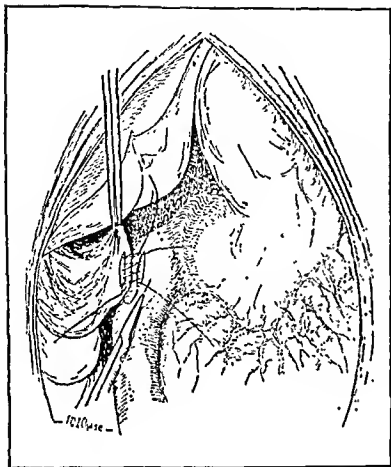


Figure 4. Anastomosis of the gallbladder to the duodenum. The same technic may be used in performing a cholecystojejunostomy.

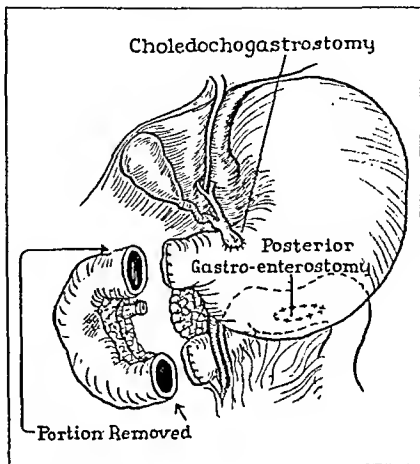


Figure 5. Illustrates an end-to-side anastomosis of the isolated common duct to the stomach. The duodenum or jejunum may also be used.

diabetic acidosis. Another patient in whom a diagnosis of cancer of the pancreas was made died twenty-two years after the performance of a cholecystoduodenostomy; obviously he did not have carcinoma. The remaining eight are living and well.

#### SUMMARY

The causes of acute and chronic pancreatitis are still unknown. When the diagnosis of acute pancreatitis has been made with the help of the serum amylase test, conservative and delayed surgical attack gives the best ultimate results. Chronic pancreatitis may simulate all the symptoms of cholelithiasis and tumors

within the lumen of the gallbladder. Jaundice may be absent, but if present, its intensity is less than that found in cancer of the pancreas. At the time of the operation chronic pancreatitis must be differentiated from cancer of the pancreas. A biopsy is of considerable help. The operations recommended have withstood the test of time for over a decade. They consist of the various anastomoses of the bile passageways with the hollow viscera.

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# Bacteriologic, Etiologic, and Serologic Studies in Epilepsy and Schizophrenia I.

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IN STUDIES on the etiology of various diseases it was found, in agreement with other investigators, that the aerobic methods usually employed in bacteriology do not suffice for the consistent isolation of causative organisms. By the use of special mediums which afforded a gradient of oxygen tension and other properties favorable for the growth of fastidious organisms, specific types of streptococci which had elective localizing power on injection into animals were isolated consistently in studies of various diseases.<sup>1,2,3,4</sup>

The results obtained in some epidemic<sup>5,6,7,8</sup> and nonepidemic diseases<sup>9,10</sup> have been reported. Those obtained in studies of epilepsy and schizophrenia over a period of a dozen years as opportunity was afforded, although highly suggestive,<sup>11</sup> have been withheld until results of a more intensive study became available. These it is felt are now at hand.

The results of studies on the isolation of alpha streptococci and of experiments in animals in which spasms and convulsive seizures and disorientation and strange symptoms in behavior were produced with the respective strains

This is first of a series of three papers by Dr. Rosenow in which are recorded the results of bacteriologic and experimental studies on the etiology of epilepsy and schizophrenia. Papers II and III will appear in later issues of *Postgraduate Medicine*.

will be reported elsewhere. Those obtained in agglutination, agglutinin absorption, and precipitation experiments with the antisera prepared in horses and rabbits and produced in vitro from the respective streptococci and with the serum of persons ill are to be reported in this paper.

## METHODS AND MATERIAL

Realizing the difficulties that have been encountered in the isolation of specific types of alpha streptococci from persons suffering from various diseases and in experiments on agglutination<sup>12</sup> and precipitation, we have used special methods to eliminate these in so far as possible. The diagnoses for the most part were made by examining physicians in charge of patients in hospitals and private practice. Cultures were made from nasopharynx, infected teeth, blood, spinal fluid, urine, and feces.

Nasopharyngeal swabbings were made with swabs wrapped on aluminum wire and bent to a suitable angle without touching the tongue. The nasopharyngeal swabbings and the material obtained from pyorrhea pockets and the severed apexes of pulpless teeth, drawn in a sterile manner, were suspended in 2 ml. of a 0.2 gelatin-Locke or isotonic sodium chloride



EDWARD C. ROSENOW

solution for cultures, precipitation tests, and inoculation of animals.

Routinely, the surface of horse blood agar plates were inoculated and serial dilution cultures<sup>13</sup> were made in mediums affording a gradient of oxygen tension, viz. in dextrose brain broth or alternately dextrose brain broth (0.2 per cent dextrose) and soft dextrose brain agar (0.2 per cent dextrose and 0.2 per cent agar) in tall (12 cm.) columns in test tubes. The dextrose brain broth and dextrose brain agar were prepared by adding, before autoclaving, approximately 1 part by volume of pieces of fresh or frozen calf or young beef brain to 6 or 7 volumes of the mediums previously adjusted to pH 7.2 and contained in  $\frac{3}{8}$  x 6- or 8-inch test tubes in columns 12 cm. in height.

THE amount of inoculum in the first tube and degree of serial dilution, usually at steps of 1-100 or 10,000, was determined by the number and kind of organism found in stained

films of the material under study. The brain-containing mediums used were freshly prepared or were boiled to drive off dissolved oxygen and cooled to 40°C. immediately before they were inoculated.

Pure cultures for inoculation of animals, and for serologic and other studies were obtained not from blood agar plates but from the end point of growth of usually young primary serial dilution cultures in dextrose brain broth or dextrose brain agar. Blood agar plates were made of these to determine the type of streptococcus and to be sure of the purity of the young cultures.

Pure cultures of streptococci obtained from patients and from animals were routinely preserved in dehydrated form by placing the centrifugated sedimented organisms from young dextrose brain broth or dextrose broth cultures of streptococci after decanting the supernatant broth in very dense suspension (300,000,000,000 per ml.) of glycerol 2 parts and saturated sodium chloride solution 1 part. Moreover, selected strains of streptococci were inoculated into previously warmed 0.2 per cent dextrose broth in gallon bottles containing 3500 ml. each, and the organisms of young cultures from a continuous feed centrifuge bowl were likewise preserved at 10°C. in dehydrated form in dense suspension of the glycerol-sodium chloride solution menstruum (1,000,000,000,000 organisms per ml.) for agglutination and precipitation tests, for immunization of horses and rabbits, and for the preparation of solutions of specific polysaccharide and thermal antibodies.<sup>14</sup>

The agglutination tests were made by placing 0.2 ml. of fivefold dilutions of 1-20 to 1-2500 of the serum or thermal antibodies into test tubes  $\frac{3}{8}$  x 3 inches and adding to each tube 0.2 ml. of the respective suspensions of streptococci containing approximately 5,000,000,000 organisms per ml. The suspensions were allowed to stand at room temperature or were lightly centrifuged to eliminate clumped organisms. The setups were thoroughly shaken and placed in the incubator at 47°C. to 50°C. for eighteen to twenty-four hours.<sup>12</sup> Readings were made in a dark room under the edge of a shaded light

TABLE 1

ILLUSTRATIVE EXPERIMENT ON THE AGGLUTINATION OF STREPTOCOCCI BY THE SERUM OF PATIENTS

SOURCE OF STREPTOCOCCAL POOLS	DILUTIONS OF SERUMS AND PER CENT OF AGGLUTINATION	DEGREE (0-4) AND PERCENTAGE OF TOTAL POSSIBLE AGGLUTINATION AT FIVEFOLD DILUTIONS OF POOLS OF 5 SERUMS EACH OF WELL PER- SONS AND OF PERSONS SUFFERING FROM:			
		EPILEPSY	SCHIZOPHRENIA	ARTHRITIS	CONTROL WELL PERSONS
EPILEPSY (11)*	1-20	2	3	2	2
	1-100	2	3	2	2
	1-500	3	0	0	0
	1-2500	3	0	0	0
	Per cent	63	38	25	25
SCHIZOPHRENIA (10)	1-20	3	3	2	2
	1-100	3	3	2	2
	1-500	2	3	0	0
	1-2500	0	2	0	0
	Per cent	50	69	25	25
ARTHRITIS (30)	1-20	2	2	2	2
	1-100	2	2	3	2
	1-500	2	0	3	0
	1-2500	0	0	3	0
	Per cent	38	25	69	25
CONTROL PNEUMOCOCCI (9)	1-20	2	2	2	2
	1-100	0	2	0	0
	1-500	0	0	0	0
	1-2500	0	0	0	0
	Per cent	13	25	13	13

\*The figures in parentheses indicate the number of strains in pools.

from a 100-watt electric light bulb against a nonreflecting background of black velvet cloth. The degree of agglutination was recorded without regard to the source or type of antibody according to the arbitrary scale of 0 to 4 plus.

Two types of thermal antibodies were used in agglutination and precipitation tests. The one designated simply as thermal antibody represented the bacteria-free supernatant of suspensions in sodium chloride solution containing 10,000,000,000 streptococci per ml. after autoclaving at 15 to 17 pounds pressure for ninety-six hours.<sup>14</sup> The other designated as thermal hydrogen peroxide antibody represented the bacteria-free supernatant of suspensions in sodium chloride solution containing 10,000,000,000 streptococci per ml. which were autoclaved for one hour after adding 1.5 per cent H<sub>2</sub>O<sub>2</sub> (initial).<sup>15</sup> The respective streptococci in both

instances represented dilutions of the partially dehydrated organisms from dense suspensions in a mixture of glycerol and saturated sodium chloride solution.

Agglutinin absorption experiments were done by adding approximately 5,000,000,000 of the washed organisms per ml. from the dense suspensions in glycerol-sodium chloride solution to the respective undiluted serums and thermal hydrogen peroxide antibody. The first two absorptions were done by incubating for one and one-half hours at 35°C. and the third absorption at 35°C. for one and one-half hours and at 10°C. for eighteen hours. The respective suspensions were centrifuged, the serum or antibody was decanted, and the agglutinin titer of the absorbed and unabsorbed serums determined in parallel manner.

For the sake of brevity and in order that the degree of agglutination of the different strains by the four dilutions of the different materials

TABLE 2

AGGLUTINATION OF ALPHA STREPTOCOCCI ISOLATED FROM THE NASOPHARYNX OR BLOOD OF PERSONS SUFFERING FROM EPILEPSY, SCHIZOPHRENIA AND ARTHRITIS BY THE ANTISERUMS\* PREPARED IN HORSES WITH THE RESPECTIVE STRAINS OF STREPTOCOCCI.

SOURCE OF STREPTOCOCCI	STREPTOCOCCAL		AGGLUTINATION EXPERIMENTS	PERCENTAGE OF TOTAL POSSIBLE AGGLUTINATION AT FIVEFOLD DILUTIONS OF 1-20 TO 1-2,500 OF ANTI- SERUMS PREPARED IN HORSES WITH STREPTOCOCCI ISOLATED IN STUDIES OF:		
	POOLS	STRAINS		EPILEPSY	SCHIZOPHRENIA	ARTHRITIS
IDIOPATHIC EPILEPSY	9	105	13	68	47	35
SCHIZO- PHRENIA	7	63	11	49	72	38
CHRONIC ARTHRITIS	7	76	12	28	30	55

\*The antiserums used were prepared in parallel manner by repeated intravenous and subcutaneous injection of appropriate dilutions of the respective heat killed (70°C. 1 hour) streptococci whose antigenic specificity was preserved throughout the long period of immunization (one and one-half years) in dense suspension (1,000,000,000 streptococci per ml.) in glycerine 2 parts and 25 per cent sodium chloride solution 1 part.

TABLE 3

AGGLUTINATION OF STREPTOCOCCI ISOLATED IN STUDIES OF EPILEPSY, SCHIZOPHRENIA AND ARTHRITIS BY THE UNABSORBED AND ABSORBED SERUM OF HORSES IMMUNIZED WITH THE RESPECTIVE STREPTOCOCCI.

SOURCE OF STREPTOCOCCI	STREPTOCOCCAL		PERCENTAGE OF TOTAL POSSIBLE AGGLUTINATION AT FIFTEENFOLD DILUTIONS OF 1-20 TO 1-2,500 OF THE UNABSORBED AND ABSORBED SERUMS OF HORSES IMMUNIZED WITH STREPTOCOCCI ISOLATED IN STUDIES OF											
			EPILEPSY				SCHIZOPHRENIA				ARTHRITIS			
			ABSORBED WITH STREPTOCOCCI ISOLATED IN STUDIES OF				ABSORBED WITH STREPTOCOCCI ISOLATED IN STUDIES OF				ABSORBED WITH STREPTOCOCCI ISOLATED IN STUDIES OF			
			UNABSORBED	Epilepsy	Schizophrenia	Arthritis	UNABSORBED	Schizophrenia	Epilepsy	Arthritis	UNABSORBED	Arthritis	Schizophrenia	Epilepsy
EPILEPSY	1	11	1	75	38	56	44	31	25	25	25	31	38	38
	1	12	1	75	31	50	49	31	31	31	38	56	56	25
SCHIZOPHRENIA	1	10	1	31	25	25	25	69	31	44	38	44	25	25
	1	12	1	38	31	19	25	63	25	44	31	44	38	44
ARTHRITIS	1	30	1	44	31	44	25	31	31	31	13	69	0	44
	1	42	1	25	13	25	6	19	13	13	6	63	0	25

containing antibodies may be readily visualized and compared in the tables and text, the percentages of total possible agglutination in the four dilutions are given. A 4-plus agglutination in each of the four dilutions, or a total of 16, would be 100 per cent; a total of 5 pluses for the four dilutions would be 5/16, or 31 per cent, and so forth. This method was found to express more accurately the agglutinin titer of serums and of antibody solutions than did the end point at which agglutination occurred.

Interface precipitation tests were made in small glass tubes (5 x 25 mm.) by superimposing the solutions of specific polysaccharide of the respective streptococci obtained by the Lancefield method and the cleared NaCl solution washings of nasopharyngeal swabbings to which 0.2 per cent phenol had been added onto the undiluted serum of patients, on the serum of horses and rabbits that had been immunized with the respective streptococci, and on the solutions of the thermal antibodies to which 0.1

per cent agar or 1 per cent gelatin were added. The degree of clouding or precipitation at the interface, after thirty minutes at 35°C. and eighteen hours at 10°C., or after eighteen to twenty-four hours at 35°C. was recorded according to the arbitrary scale of 0 to 4 plus.

#### RESULTS OF CULTURES

Cultures on blood agar plates and some dilutions of cultures in dextrose brain broth or soft dextrose brain agar were made of nasopharyngeal swabbings from 181 persons suffering from epilepsy, from 258 persons suffering from schizophrenia, 85 persons suffering from either chronic or subacute arthritis, and, as a control, from 78 well persons. Green-producing colonies of alpha streptococci grew in greatly predominating numbers in most of the cultures and indifferent colonies in a few instances, never in predominating numbers. Variable numbers of colonies of *Micrococcus catarrhalis* and of staphylococci grew in most instances, and in no instance did *Hemophilus influenzae* grow in

large numbers. There was no distinctive difference between the type of colonies that grew in the different groups. In general, however, the number of colonies was greater, often far greater, in the persons who were ill than in those who were well.

Shake cultures in blood agar and serial dilution cultures in dextrose brain broth or alternately in dextrose brain broth and dextrose brain agar were made from the spinal fluid in 24 individuals, from the urine in 10, from the apexes of pulpless teeth extracted in a sterile manner in 24, and from the stool in 23 persons suffering from schizophrenia. The spinal fluids proved sterile; greening streptococci were isolated in small numbers from the urine, and in large numbers from the teeth; and greening or indifferent streptococci were isolated in 19 of the 23 stools cultured.

Cultures in the dextrose brain broth of the partially macerated blood clot yielded highly pleomorphic greening or indifferent streptococci to blood agar in 49, or 29 per cent, of 161 persons suffering from epilepsy, in only 5, or

TABLE 4

AGGLUTINATION OF ALPHA STREPTOCOCCI ISOLATED IN STUDIES OF EPILEPSY, SCHIZOPHRENIA AND ARTHRITIS BY THE SERUM OF RABBITS BEFORE AND AFTER IMMUNIZATION WITH THE RESPECTIVE STRAINS OF STREPTOCOCCI.\*

SOURCE OF STREPTOCOCCI	STREPTOCOCCAL		PERCENTAGE OF TOTAL POSSIBLE AGGLUTINATION BY THE SERUM OF RABBITS AT FIVEFOLD DILUTIONS, 1-20 TO 1-2,500 BEFORE AND AFTER IMMUNIZATION WITH STREPTOCOCCI ISOLATED IN STUDIES OF							
	POOLS	STRAINS	EPILEPSY		SCHIZOPHRENIA				ARTHRITIS	
			RABBIT 8		RABBIT 6		RABBIT 7		RABBIT 9	
			Normal	Immune	Normal	Immune	Normal	Immune	Normal	Immune
EPILEPSY	1	15	0	56	13	19	0	25	0	19
	1	16	19	81	25	50	25	50	13	38
	1	17	0	56	6	13	19	25	0	0
TOTAL	3	43	6	64	15	27	15	33	4	19
SCHIZOPHRENIA	1	10	19	38	25	81	25	63	19	25
	1	8	25	44	25	88	25	88	25	38
	1	18	13	25	25	56	19	63	13	25
TOTAL	3	36	19	36	25	75	23	71	19	29
ARTHRITIS	1	31	13	25	19	31	6	25	13	56
	1	31	19	25	13	19	6	19	0	63
	1	65	13	0	0	19	0	6	6	56
TOTAL	3	96	15	17	11	23	4	17	6	58

\*The antisera used were prepared in parallel manner by three daily intravenous and subcutaneous injections per week for four weeks of the respective heat killed (65°C. 1 hour) streptococci. The rabbits were bled before the first and ten days after the last injection and the agglutination tests were done ten days after the immunized rabbits were bled.

TABLE 5

AGGLUTINATION OF STREPTOCOCCI ISOLATED IN STUDIES OF EPILEPSY, SCHIZOPHRENIA AND ARTHRITIS BY THE UNABSORBED AND ABSORBED SERUMS OF RABBITS THAT HAD BEEN IMMUNIZED WITH THE RESPECTIVE STREPTOCOCCI.

SOURCE OF STREPTOCOCCI	STREPTOCOCCAL		PERCENTAGE OF TOTAL POSSIBLE AGGLUTINATION OF RESPECTIVE STREPTOCOCCI BY THE SERUMS OF RABBITS AT FIVEFOLD DILUTIONS OF 1-20 TO 1-2,500 IMMUNIZED WITH THE STREPTOCOCCI ISOLATED IN STUDIES OF								
			EPILEPSY			SCHIZOPHRENIA			ARTHRITIS		
			RABBIT 8			RABBIT 6			RABBIT 9		
			ABSORBED WITH STREPTOCOCCI ISOLATED IN STUDIES OF			ABSORBED WITH STREPTOCOCCI ISOLATED IN STUDIES OF			ABSORBED WITH STREPTOCOCCI ISOLATED IN STUDIES OF		
	POOLS	STRAINS	UNABSORBED	Epilepsy	Arthritis	UNABSORBED	Schizophrenia	Arthritis	UNABSORBED	Arthritis	Epilepsy
EPILEPSY	1	13	75	31	44	25	25	25	31	31	31
	1	16	69	44	63	50	50	50	50	38	25
SCHIZOPHRENIA	1	10	50	44	44	69	38	56	31	25	25
	1	8	50	38	44	69	38	63	50	50	44
ARTHRITIS	1	31	23	19	19	25	19	19	50	6	44
	1	65	25	19	19	25	19	19	50	0	31

4 per cent, of 125 persons suffering from schizophrenia, in 7, or 14 per cent, of 69 persons having chronic arthritis, and in not one of 62 well persons or persons suffering from noninfectious ailments. The incidence of isolation of streptococci from the blood in persons having epilepsy was highest shortly before or during seizures, and most of the 49 persons from whose blood the streptococcus was isolated were taking phenobarbital or dilantin or both at the time the blood was drawn.

## RESULTS OF AGGLUTINATION EXPERIMENTS

The type of agglutination experiments which were done, the way results were recorded, and the method of determining the percentage of agglutination and of indicating specificity are shown in *Table 1*. The results of agglutination of a large number of the respective strains by the different antisera, by thermal antibodies, and by the serum of patients are summarized in *Tables 2, 4, 6, 7, and 8*. A high degree of respective specific agglutination was obtained with

TABLE 6

AGGLUTINATION OF ALPHA STREPTOCOCCI ISOLATED IN STUDIES OF EPILEPSY, SCHIZOPHRENIA AND ARTHRITIS BY THERMAL ANTIBODY PREPARED FROM THE RESPECTIVE STRAINS OF STREPTOCOCCI, 20,000,000,000 PER ML. IN NaCl SOLUTION, AUTOCLAVED FOR 96 HOURS.

SOURCE OF STREPTOCOCCI	STREPTOCOCCAL		AGGLUTINATION EXPERIMENTS		ANTIBODY PREPARATIONS	PERCENTAGE OF TOTAL POSSIBLE AGGLUTINATION AT FIVEFOLD DILUTIONS OF 1-20 TO 1-2,500 OF THERMAL ANTIBODY PREPARED FROM STREPTOCOCCI ISOLATED IN STUDIES OF		
						Epilepsy	Schizophrenia	Arthritis
	POOLS	STRAINS	NUMBER	TIME				
EPILEPSY	1	11	8	1945	4	50	30	0
	1	12	6	1946	5	44	25	0
SCHIZOPHRENIA	1	10	9	1945	4	38	50	0
	1	15	7	1946	5	38	63	13
ARTHRITIS	1	30	7	1945	4	38	38	50
	1	12	8	1946	5	31	38	56

TABLE 7

AGGLUTINATION OF ALPHA STREPTOCOCCI ISOLATED IN STUDIES OF EPILEPSY, SCHIZOPHRENIA, ARTHRITIS AND RESPIRATORY INFECTIONS BY THERMAL ANTIBODY PREPARED FROM THE RESPECTIVE STRAINS OF STREPTOCOCCI, 10,000,000,000 PER ml. IN NaCl SOLUTION PLUS 1.5% H<sub>2</sub>O<sub>2</sub> AND AUTOCLAVED FOR ONE HOUR.

SOURCE OF STREPTOCOCCI	STREPTOCOCCAL		PERCENTAGE OF TOTAL POSSIBLE AGGLUTINATION AT FIVEFOLD DILUTIONS OF 1-20 TO 1-2,500 OF THERMAL ANTIBODY PREPARED IN VITRO FROM STREPTOCOCCI ISOLATED IN STUDIES OF							
			EPILEPSY (10)*		SCHIZOPHRENIA (14)		ARTHRITIS (5)		RESPIRATORY INFECTIONS (8)	
	POOLS	STRAINS	Tests	Per cent Agglutination	Tests	Per cent Agglutination	Tests	Per cent Agglutination	Tests	Per cent Agglutination
EPILEPSY	13	83	39	63	48	53	6	38	14	52
SCHIZOPHRENIA	13	118	42	47	67	68	6	45	19	47
ARTHRITIS	3	44	21	40	28	35	8	73	12	50
RESPIRATORY INFECTIONS	8	175	23	48	26	51	7	38	17	73

\*Figures in ( ) indicate the number of preparations of thermal antibody used in the agglutination tests.

TABLE 8

AGGLUTINATION OF STREPTOCOCCI ISOLATED IN STUDIES OF EPILEPSY, SCHIZOPHRENIA, ARTHRITIS AND RESPIRATORY INFECTIONS BY THE SERUMS OF PERSONS SUFFERING FROM EPILEPSY, SCHIZOPHRENIA OR ARTHRITIS AND OF WELL PERSONS.

SOURCE OF STREPTOCOCCI	STREPTOCOCCAL		EXPERIMENTS		PERCENTAGE OF TOTAL POSSIBLE AGGLUTINATION OF RESPECTIVE STREPTOCOCCI AT FIVEFOLD DILUTIONS OF 1-20 TO 1-2,500 OF THE SERUM OF PERSONS SUFFERING FROM			
	POOLS	STRAINS	NUMBER	TIME OF	EPILEPSY (137)*	SCHIZOPHRENIA (108)	ARTHRITIS (53)	CONTROL WELL PERSONS (59)
EPILEPSY	2	23	9	1945	64	45	19	20
	10	133	30	1946	58	35	12	15
SCHIZOPHRENIA	2	22	9	1945	45	68	26	19
	6	58	23	1946	42	60	25	13
ARTHRITIS	2	43	9	1945	14	19	53	16
	4	43	14	1946	10	10	37	13
RESPIRATORY INFECTIONS	3	115	4	1945	22	18	27	36

\*The figures in ( ) indicate the number of patients whose serum was used. About one-half were tested in 1945 and 1946 respectively. However, the agglutinating action of the former group was determined in pools of 4-6 while that of the serums of the latter group was determined separately.

TABLE 9

AGGLUTINATION OF STREPTOCOCCI ISOLATED IN STUDIES OF EPILEPSY, SCHIZOPHRENIA AND ARTHRITIS BY THE UNABSORBED AND ABSORBED SERUMS OF RESPECTIVE PATIENTS AND BY THERMAL ANTIBODY.

STREPTOCOCCI		EXPERIMENTS		PERCENTAGE OF TOTAL POSSIBLE AGGLUTINATION AT FIVEFOLD DILUTIONS OF 1-20 TO 1-2,500 OF SERUM OF PATIENTS SUFFERING FROM													THERMAL ANTIBODY PREPARED FROM STREPTOCOCCI ISOLATED IN STUDIES OF EPILEPSY		
				EPILEPSY			SCHIZOPHRENIA			ARTHRITIS									
SOURCE OF STREPTOCOCCI	POOLS	STRAINS	NO.	TIME	UNABSORBED	ABSORBED WITH STREPTOCOCCI ISOLATED IN STUDIES OF		UNABSORBED	ABSORBED WITH STREPTOCOCCI ISOLATED IN STUDIES OF		UNABSORBED	ABSORBED WITH STREPTOCOCCI ISOLATED IN STUDIES OF		UNABSORBED	ABSORBED WITH STREPTOCOCCI ISOLATED IN STUDIES OF				
						Epilepsy	Arthritis		Schizo- phrenia	Arthritis		Arthritis	Epilepsy		Epilepsy	Arthritis			
EPILEPSY	2	23	2	1945	56	13	38	38	13	25	25	13	13	63	44	50			
	1	11	1	1946	69	13	38	50	38	25	.....	.....	.....	69	56	.....			
SCHIZOPHRENIA	2	21	2	1945	25	13	25	54	0	38	0	13	13	50	44	31			
	1	10	1	1946	38	25	25	57	19	38	.....	.....	.....	31	31	.....			
ARTHRITIS	2	43	2	1945	19	25	19	19	25	13	56	13	38	44	44	31			
	1	30	1	1946	25	25	13	38	25	13	.....	.....	.....	44	31	.....			

TABLE 10

AGGLUTINATION OF STREPTOCOCCI AND PRECIPITATION OF STREPTOCOCCAL POLYSACCHARIDES BY THE SERUM OF PERSONS SUFFERING FROM EPILEPSY IN RELATION TO GRAND MAL SEIZURES.

SOURCE OF STREPTOCOCCI	STREPTOCOCCAL		PERCENTAGE OF TOTAL POSSIBLE AGGLUTINATION OF THE RESPECTIVE STREPTOCOCCI AT FIVEFOLD DILUTIONS OF 1-20 TO 1-2,500 OF THE SERUM OF PERSONS SUFFERING FROM EPILEPSY OBTAINED SHORTLY BEFORE AND AFTER GRAND MAL SEIZURES.											
			CASE 1		CASE 2		CASE 3		CASE 4		CASE 5			
	POOLS	STRAINS	B*	A*	B	A	B	A	B	A	B	A	B	A
EPILEPSY	1	11	44	69	56	63	44	56	38	63	56	81		
SCHIZOPHRENIA	1	10	31	50	25	38	31	44	38	50	38	50		
ARTHRITIS	1	30	38	31	0	0	25	13	13	25	25	25		
ENCEPHALITIS	1	24	38	25	0	0	38	25	13	38	31	31		
RESPIRATORY INFECTIONS	1	95	31	38	25	13	25	13	0	13	31	31		
PEPTIC ULCER	1	12	31	13	0	0	13	25	0	13	13	13		
PERCENTAGE OF PRECIPITATION OF RESPECTIVE STREPTOCOCCAL POLYSACCHARIDES.														
EPILEPSY	1	11	25	50	50	25	50	25	50	50	50	75		
SCHIZOPHRENIA	1	10	0	25	25	25	25	25	0	25	25	25		
ARTHRITIS	1	30	0	0	25	25	0	25	0	25	25	25		

\*B=1-3 hours before seizures. A=1-3 hours after seizures. The degree of precipitation was recorded according to the arbitrary scale of 0-4 plus, each plus representing 25 per cent.

each of the different types of antisera, with the thermal antibody, and with the serum of the patients.

The results of experiments on specificity of agglutinins by absorption from the respective sera and thermal antibody with homologous and heterologous streptococci are summarized in *Tables 3, 5, and 9*. It will be seen that absorptions with the homologous strains consistently caused a far greater reduction of agglutinins than heterologous strains. Moreover, the reduction was usually relatively greater by the more closely related heterologous strains isolated in studies of epilepsy and schizophrenia, respectively, than by more distantly related strains isolated in studies of arthritis.

Thermal antibody, the sera of horses and rabbits that had been immunized with the respective streptococci, and the serum of persons all agglutinated specifically the streptococci isolated from nasopharynx, apex of pulpless teeth, and blood, but did not agglutinate the streptococci isolated from the urine and feces.

The agglutinin titers of the sera of patients suffering from epilepsy shortly before and shortly after grand mal seizures over streptococci isolated in studies of different diseases and precipitation of polysaccharide obtained from streptococci isolated in studies of epilepsy,

schizophrenia, and arthritis are summarized in *Table 10*. It will be seen that the agglutinin and precipitin titers were consistently higher with the serum obtained shortly after seizures than with the serum obtained shortly before seizures. This was associated with a sharp drop in specific streptococcal antigen in skin or blood determined by intradermal injection of antibody (to be reported elsewhere).

#### RESULTS OF PRECIPITATION EXPERIMENTS

The results of precipitation experiments with the antisera prepared in rabbits and horses, the serum of patients, and the two types of thermal antibodies over different dilutions of polysaccharide of the respective streptococci are summarized in *Tables 11, 12, and 13*, and those obtained with antiserum of horses, rabbits, and serum of patients over cleared sodium chloride solution washings of nasopharyngeal swabbings are shown in *Table 14*. A high degree of specificity was consistently obtained with each of the materials containing antibody.

#### COMMENTS AND SUMMARY

The results of agglutination and precipitation experiments with suspensions, extracts,



and solutions of polysaccharide of alpha streptococci isolated in studies of idiopathic epilepsy, schizophrenia, and as controls in arthritis, and the serum of respective patients, the serum of horses and rabbits that had been immunized with the respective streptococci, and thermal antibodies prepared in vitro from streptococci isolated in studies of epilepsy, schizophrenia, and arthritis are reported.

A consistently high degree of specific agglutination of the respective streptococci and of specific agglutinin absorption and a correspondingly high degree of specific precipitation of extracts of the streptococci, of extracts of naso-

pharyngeal swabbings, and of solutions of polysaccharide by the serums of patients, by the serums of immunized horses and rabbits, and by thermal antibody were obtained.

The streptococci subjected to the serologic tests were isolated chiefly during studies of the past two years, but some were taken as long as twelve years before from nasopharyngeal swabbings, from infected teeth, and from the blood of widely separated groups of persons suffering from the respective diseases.

Success in separating the specific types of alpha streptococci from saprophytic types normally present in nasopharynx of human

TABLE II

PRECIPITATION REACTION BETWEEN THE SERUM OF RABBITS IMMUNIZED WITH STREPTOCOCCI ISOLATED IN STUDIES OF EPILEPSY, SCHIZOPHRENIA AND ARTHRITIS AND THE POLYSACCHARIDE OF THE RESPECTIVE STREPTOCOCCI.

SOURCE OF STREPTOCOCCI	SOLUTION OF POLYSACCHARIDE FROM 50 BILLION STREPTOCOCCI PER ml. OF FOLLOWING POOLS OF STREPTOCOCCI			PRECIPITATION (0-4) AT THE INTERFACE BETWEEN SOLUTIONS OF POLYSAC- CHARIDE OF STREPTOCOCCI AND THE SERUM OF RABBITS IMMUNIZED WITH STREPTOCOCCI ISOLATED IN STUDIES OF							
	POOLS*	STRAINS	DILUTION	EPILEPSY		SCHIZOPHRENIA				ARTHRITIS	
				RABBIT 8		RABBIT 6		RABBIT 7		RABBIT 9	
				Normal	Immun- ized	Normal	Immun- ized	Normal	Immun- ized	Normal	Immun- ized
EPILEPSY	844	46	1-0	0	3	0	1	0	2	0	2
			1-10	.....	1	0	0	.....	0	.....	1
			1-100	.....	1	0	0	.....	0	.....	0
	1075	16	1-0	0	3	0	1	0	2	0	1
			1-10	.....	2	0	1	.....	1	.....	1
			1-100	.....	2	0	0	.....	0	.....	0
	144	12	1-0	0	3	0	2	0	1	0	1
			1-10	.....	2	0	0	.....	0	.....	0
			1-100	.....	1	0	0	.....	0	.....	0
SCHIZOPHRENIA	845	28	1-0	0	1	0	4	0	3	0	1
			1-10	.....	0	0	2	.....	2	.....	0
			1-100	.....	0	0	1	.....	1	.....	0
	896	11	1-0	0	2	0	4	0	4	0	2
			1-10	.....	1	0	1	.....	3	.....	0
			1-100	.....	0	0	1	.....	2	.....	0
	146	12	1-0	0	2	0	4	0	4	0	1
			1-10	.....	1	0	2	.....	2	.....	1
			1-100	.....	0	0	1	.....	2	.....	0
ARTHRITIS	864	31	1-0	0	1	0	2	0	2	0	3
			1-10	.....	1	0	1	.....	1	.....	2
			1-100	.....	0	0	0	.....	0	.....	1
	862	1	1-0	0	1	0	2	0	2	0	4
			1-10	.....	1	0	2	.....	2	.....	3
			1-100	.....	0	0	0	.....	0	.....	2
	5592	12	1-0	0	1	0	2	0	1	0	3
			1-10	.....	1	0	0	.....	1	.....	2
			1-100	.....	0	0	0	.....	0	.....	1
CONTROL NaCl SOLUTION			1-0	0	0	0	0	0	0	0	0

\*Figures indicate laboratory number of respective pools.

beings is attributable to the serial dilution methods used in the primary isolations. The maintenance of respective original specificity for agglutination and precipitation studies, for the preparation of specific antisera, and also for production of thermal antibodies with heat alone, or with hydrogen peroxide and much less heat, is attributable to the preservation of specific properties of freshly isolated streptococci in dehydrated form in the dense suspension of glycerine, 2 parts and saturated sodium chloride solution, 1 part. Viability and specific virulence were often maintained for as long as two years in this menstruum, and antigenic specificity was maintained apparently indefinitely. In extended studies of alpha streptococci as isolated in studies of various diseases we have not been able to find a medium which will maintain viability, elective localizing power, or virulence, and specific serologic properties over prolonged periods. From these studies it be-

came apparent that dormancy of cultures kept under proper conditions is especially favorable for maintaining viability and specific properties. Keeping cultures frozen in dry ice or in dehydrated form in vacuo on glass beads, although a usually satisfactory method, is cumbersome and not suited for routine studies. Viability of cultures of the respective streptococci was maintained for several years at room temperature without transfer in autoclaved chick embryo medium in tall columns layered with liquid petrolatum; however, changes in virulence and antigenicity occurred seasonally in accord with epidemics of respiratory and other infections.

Viability and antigenic specificity but usually not virulence were maintained in cultures of streptococci and pneumococci on blood agar slants sealed with sterilized paraffined corks or screw caps when stored at room temperature in the dark for years without transfer. Here also dormancy and reduced oxygen tension are

TABLE 12

PRECIPITATION REACTION BETWEEN THE SERUMS OF HORSES IMMUNIZED WITH STREPTOCOCCI ISOLATED IN STUDIES OF EPILEPSY,<sup>1</sup> SCHIZOPHRENIA AND ARTHRITIS, THE SERUM OF PERSONS SUFFERING FROM THESE DISEASES AND THE POLYSACCHARIDE OF THE RESPECTIVE STREPTOCOCCI

SOURCE OF STREPTOCOCCI	SOLUTION OF POLYSACCHARIDE FROM 50 BILLION STREPTOCOCCI PER ml. OF FOLLOWING POOLS OF STREPTOCOCCI			PRECIPITATION (0-4) AT THE INTERFACE BETWEEN SOLUTIONS OF POLYSACCHARIDE AND THE SERUM OF					
				HORSES IMMUNIZED WITH STREPTOCOCCI ISOLATED IN STUDIES OF			PERSONS SUFFERING FROM		
	Pools*	Strains	Dilution	Epilepsy	Schizophrenia	Arthritis	Epilepsy	Schizophrenia	Arthritis
EPILEPSY	844	46	1-10	3	2	2	2	0	0
			1-100	2	1	1	1	0	0
	1075	16	1-10	3	1	2	1	0	0
			1-100	2	0	1	1	0	0
SCHIZOPHRENIA	144	12	1-10	4	1	2	2	0	0
			1-100	2	0	1	2	0	0
	845	28	1-10	2	2	1	0	1	0
			1-100	0	1	0	0	1	0
ARTHRITIS	896	11	1-10	2	2	1	0	2	0
			1-100	0	1	0	0	0	0
	146	12	1-10	1	3	1	1	1	0
			1-100	0	2	1	0	1	0
CONTROL NaCl SOLUTION	846	31	1-10	2	1	4	0	1	0
			1-100	1	0	2	0	0	1
	862	1	1-10	2	1	3	0	0	0
			1-100	1	0	2	0	0	1
5592	12	1-10	2	2	4	0	0	1	
		1-100	1	0	2	0	0	1	
CONTROL NaCl SOLUTION			1-10	0	0	0	0	0	0

\*Figures indicate laboratory number of respective pools.

important. The overlying gas in sealed blood agar slant cultures became rich in carbon dioxide. When carbon dioxide was displaced with atmospheric oxygen on breaking the seal while making subcultures, death of the surviving organisms usually occurred promptly.

The data obtained in this study and those obtained in the experiments on animals with the freshly isolated strains and those of cutaneous tests made with natural and thermal streptococcal antibodies and antigen (to be reported elsewhere) indicate that (1) persons suffering from epilepsy and schizophrenia, despite the usual absence or slight symptoms of an active

infection, harbor in their nasopharynx, apexes of pulpless teeth, and sometimes in their blood specific types of alpha streptococci which are not harmless or casual invaders but which are specifically antigenic; (2) the streptococci and the "neurotoxins" which they produce have predilection for certain structures in the brain, and (3) they may play an important role in the pathogenesis of epilepsy and schizophrenia. Studies on the nature of the respective neurotoxins produced by the streptococci and the use of streptococcal vaccines and thermal antibodies in prevention and treatment are in progress at the present time.

TABLE 13

PRECIPITATION REACTION BETWEEN SOLUTIONS OF THERMAL ANTIBODY AND POLYSACCHARIDE PREPARED RESPECTIVELY FROM STREPTOCOCCI ISOLATED IN STUDIES OF EPILEPSY, SCHIZOPHRENIA AND ARTHRITIS.

FILTRATES OF SOLUTIONS OF POLYSACCHARIDE PREPARED FROM STREPTOCOCCI (50 BILLION PER ml.) ISOLATED IN STUDIES OF	STREPTOCOCCAL		DILUTIONS OF POLYSACCHARIDE	PRECIPITATION AT INTERFACE BETWEEN POLYSACCHARIDE OF STREPTOCOCCI AND FILTRATES OF THERMAL ANTIBODY PREPARED FROM STREPTOCOCCI ISOLATED IN STUDIES OF EPILEPSY, SCHIZOPHRENIA AND ARTHRITIS BY AUTOCLAVING THE RESPECTIVE NaCl SOLUTION SUSPENSIONS FOR					
	POOLS*	STRAINS		NINETY-SIX HOURS (20 BILLION PER ml.)			ONE HOUR + 1.5% H <sub>2</sub> O <sub>2</sub> (10 BILLION PER ml.)		
				Epilepsy	Schizophrenia	Arthritis	Epilepsy	Schizophrenia	Arthritis
EPILEPSY	844	46	1-0	1	0	0	2	1	0
			1-10	1	2	1	2	1	0
			1-100	2	1	1	3	1	0
	1075	16	1-0	1	1	0	3	2	0
			1-10	2	1	1	2	1	0
			1-100	1	0	0	1	0	0
	144	12	1-0	2	1	0	3	2	0
			1-10	2	1	1	2	1	1
			1-100	1	0	0	1	0	0
SCHIZOPHRENIA	845	28	1-0	1	2	0	3	3	1
			1-10	1	3	1	1	2	0
			1-100	0	2	0	1	2	0
	896	11	1-0	1	2	0	3	4	1
			1-10	2	3	1	1	2	0
			1-100	1	2	0	1	2	0
	146	12	1-0	1	3	0	3	4	1
			1-10	1	2	1	1	2	1
			1-100	0	1	0	1	2	0
ARTHRITIS	864	31	1-0	1	1	2	2	2	2
			1-10	1	2	2	0	0	0
			1-100	1	1	2	0	0	0
	862	1	1-0	1	2	3	3	3	2
			1-10	1	1	1	0	0	1
			1-100	0	0	1	0	0	1
	5592	12	1-0	1	1	1	3	3	1
			1-10	1	1	2	1	1	1
			1-100	0	0	1	0	0	1

\*Figures indicate laboratory numbers of respective pools.

TABLE 14

PRECIPITATION AT THE INTERFACE BETWEEN NaCl SOLUTION WASHINGS OF NASOPHARYNGEAL SWABBINGS OF PERSONS SUFFERING FROM EPILEPSY, SCHIZOPHRENIA AND ARTHRITIS AND THE SERUMS OF RESPECTIVE PATIENTS AND THE SERUMS OF HORSES AND RABBITS THAT HAD BEEN IMMUNIZED WITH THE RESPECTIVE STREPTOCOCCI.

SOURCE OF ANTIGEN: NASOPHARYNGEAL SWABBINGS	PERCENTAGE OF PRECIPITATION AT INTERFACE BETWEEN CLEARED NaCl SOLUTION WASHINGS OF NASOPHARYNGEAL SWABBINGS AND THE SERUM OF											
	HORSES IMMUNIZED WITH STREPTOCOCCI ISOLATED IN STUDIES OF				RABBITS IMMUNIZED WITH STREPTOCOCCI ISOLATED IN STUDIES OF				PERSONS SUFFERING FROM			
	Schizo-				Schizo-				Schizo-			
	Cases	Epilepsy	phrenia	Arthritis	Cases	Epilepsy	phrenia	Arthritis	Cases	Epilepsy	phrenia	Arthritis
EPILEPSY	20	65	35	10	20	85	25	0	20	70	0	0
	21	67	38	14								
	17	65	29	0	10	80	70	10	10	40	0	10
	10	70	0	0	10	50	50	10	10	70	20	0
	68	68	32	7	40	75	38	5	57	61	4	2
SCHIZOPHRENIA	26	0	58	4	26	23	69	4	26	8	62	
	46	7	72	0								
	10	0	70	0					10	0	80	
	20	10	70	5					20	10	60	
	102	5	68	2	26	23	69	4	56	7	64	2
ARTHRITIS	27	0	7	41								
WELL CONTROLS	14	7	0	0	14	7	0	0	14	0	7	0
	34	3	0	0								
	17	0	6	6					17	0	0	0
	20	0	0	0	20	15	10	5	20	10	0	0
	85	2	1	1	34	12	6	3	51	4	2	0

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# Fluorine in Control of Children's Tooth Decay

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**T**OOOTH decay is the most prevalent disease in the world. The recovered skulls of all ages except the Iron Age show teeth with decay. The Bronze Age skulls show 37 per cent with decay, whereas the skulls of the Roman colonists show 85 per cent.<sup>1</sup> Throughout the world today we see almost as much variation in groups living in different parts of the world. Polynesians in Samoa have shown 4 per cent with decay,<sup>2</sup> people in Tripolitania 50 per cent, and a group of children in Hawaii exhibited 99.9 per cent.<sup>3</sup>

Hawaii, with its mixed population, its warm, even climate, and the excellent medical control of the children on the sugar plantations, seemed an ideal place in which to study this problem. One study<sup>4</sup> showed 74 infants on a rice diet with 99.9 per cent with decay, and 50 per cent of all erupted teeth decayed. In a comparable group of 42 infants whose rice (acid residue starch) had been replaced by taro (a tuber with alkaline residue starch) only 7 per cent showed decay. Another group of 22 Polynesian children<sup>5</sup> living on a poi and fish diet had almost perfect teeth, whereas 55 Polynesians living in Honolulu, eating rice and bread, showed 98.2 per cent with decay. Ferguson recorded that decay was due to miscegenation, but the Island of Tristan da Cunha with 156 people of mixed races showed only 11 per cent with decay.<sup>5</sup>

In a study made in 1930, 779 Japanese children showed only two with noncaries mouths,<sup>3</sup> whereas at the same age in the same age group 109 Caucasian children showed 55.6 per cent with decay-free mouths. These children had much more fruit and vegetables and less cereal starches. The water was the same for both groups of children.

Because of certain dog experiments that seemed to verify the importance of the acid radicals in the diet,<sup>6</sup> it was assumed that the cause of decay was the excess of acid radicals in the food, since 50 per cent to 80 per cent of the calories came from acid residue rice. Another study made in 1937 seemed to confirm this.<sup>7</sup> A third study on 1140 children was made in 1940 to make a further check on the evidence presented.

The Dental Research Committee of the Honolulu Dental Association, consisting of 12 well-trained dentists, agreed to do the dental survey. Four main groups were studied. Group I consisted of approximately 250 children under the age of three, living on a plantation, who had been fed a well-balanced diet at the plantation health center every day for a period of seventeen years. The second group were the same type of children living eight miles away; these, however, had had no special feeding clinics. Group III consisted of specially selected



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the local children. Yet the surprising fact was that their teeth were much better, with 89 per cent of their teeth being free of decay. This evidence suggested that a "good" or "bad" diet was not the answer, but that if certain elements were present in a diet, even though it was insufficient to produce good general health, tooth decay might be inhibited.

Of a group of 180 kindergarten children 55 per cent of the 3677 teeth were decayed, whereas of the 102 immigrant Filipinos only 11 per cent were decayed. Thirty-seven per cent of the teeth of the 278 Filipino children born and raised in Hawaii showed decay, and only 4.7 per cent of the mouths were entirely free of decay. On the other hand, 48 per cent of the newly arrived Filipinos' mouths were free of decay. Table 1 shows decay by races.

A careful diet check showed that the local Oriental diet was low in vegetables, legumes, fruits, milk, and even sweets, compared with a standard diet. It was high in cereals and proteins. At the health center 250 children under four years of age were fed a daily tuber, vegetable, and milk diet in place of the usual rice diet. In a study of the children on that plantation who were six years or younger, 66 per cent had perfect sets of teeth, and 87 per cent of all erupted teeth were decay-free. Of 127 children of the same age group on the nondiet plantation only 9 per cent had perfect sets and only 49 per cent of all teeth were free of decay. However, when a study was made of the chil-

TABLE 1  
TOOTH DECAY BY NATIONALITIES

Nationality	Number of Children	Number of Decayed, Missing, Filled	Decay Free Teeth	Percent of DMF in All Teeth	Percent of Children Decay-Free
Japanese	556	6,565	6,525	50	1.0
Filipino	266	2,147	4,111	34	5.6
Miscegenetic	102	905	1,441	38	8.8
Chinese	44	430	552	43	6.3
Caucasian	44	286	641	31	11.3
Porto Rican	15	254	100	71	6.6
Korean	5	61	55	52	0.7
Hawaiian	4	68	28	70	25.0
New Filipinos	100	253	1,771	12	47.0
Totals	1,136	10,660	15,224	41	7.6

children living on plantation No. 2 but coming from a higher economic bracket. Group IV consisted of 102 newly arrived Filipinos who were undernourished, anemic, and heavily infested with intestinal parasites. Examination showed very few of the latter children had firm muscles. The majority had distended abdomens and were definitely undersized compared with

dren living on these two plantations who were six years old and over, it was revealed that 40.8 per cent of the teeth of those on the diet were decayed as compared to 41.6 per cent of the teeth of those who were not on a diet. This was a mathematically insignificant difference.

were high in fluorine. About this time (1945) the Navy put out a study on rats<sup>13, 14</sup> in which it was shown that oxalates gave a form of surface protection that apparently provided as much decay resistance as fluorine. The value of these two factors, fluorine and oxalates,

TABLE 2

	GROUP GIVEN CALCIUM FLUORIDE		CONTROL GROUP OF 45 CHILDREN	
	Before Tablets	After Tablets	First Examination	Second Examination
Teeth with active decay .....	941	354	265	306
Teeth with nonactive decay.....	178	882	28	74
Decay-free teeth .....	805	721	385	411

IT SEEMED evident that water alone—they all drank the same water—or sunshine alone—they all had seven and a half hours of sunshine daily—wasn't the factor. Heredity did not seem to be important because Oriental children on certain diets had good teeth and others on different diets had bad teeth. Filipinos in Hawaii had bad teeth, whereas newly arrived Filipinos had good teeth. The relation of the toothbrush to tooth decay seemed unimportant, since those with good or bad teeth performed this rite equally. The acid base factor alone did not seem to be the answer since many of the newly arrived Filipinos ate rice three times a day. It was a home-threshed rice, but acid residue. To stop eating candy is not the answer. Some high candy eaters have no decay, whereas many low sugar eaters have considerable decay. The California studies<sup>8</sup> showed that although an excess of sugar definitely seemed to increase the growth of lactobacilli, 10.4 teaspoons of sugar a day was used by the students with perfect teeth. In the experiment by Percy Howe<sup>9</sup> monkeys were fed adhesive sugar balls twice daily for eight months and they did not develop any dental caries.

Hence it seemed other factors might be responsible for the rampant tooth decay found. Recent studies<sup>10</sup> showed the water in Hawaii to be low in fluorine—0.02 parts per million to 0.2 parts per million. Other studies had shown that brackish water and fish foods<sup>11, 12</sup>

which were unknown as possible controlling factors at the time of the previous studies, might prove to be as important as, or even more important than, the previously enunciated acid base factor.

To try to determine the effect of fluorine, a group of 180 kindergarten children were used for intensive study, since they had very rampant tooth decay (55 per cent). Rampant tooth decay is commonly seen in Hawaii in the deciduous teeth and is called odontoclasia. It is a rapidly spreading surface enamel decay that can be differentiated from ordinary caries, though the causes may be the same. One hundred and nineteen of these children were told to suck one calcium fluoride tablet a day (2.0 mg. calcium fluoride, 30.0 mg. vitamin C and 400 I.U.U.S.P.XII vitamin D\*). The children were given these tablets over a period of about four months. Each child received an average of 98 tablets. The results are shown in Table 2.

THE fact that the control group of 45 children were not receiving fluorine was known to the dentists. The figures seemed to show a striking difference. Apparently calcium fluoride tablets had caused a definite decrease in the activity. The dentists were quite convinced that the activity was decreased. How-

\*Supplied through courtesy of Ayerst, McKenna & Harrison, Ltd.



Plantation Children



Dental survey being made in 1946 in the Health Center room of plantation.



ever, scattered among the children getting fluorine were some 24 children who did not receive the tablets. The dentists were unaware of this fact. Table 3 shows the results among this group.

TABLE 3

	First Examination	Second Examination
Teeth with active decay . . . .	181	58
Teeth with nonactive decay . . . .	25	123
Decay-free teeth . . . .	270	218

The fluorine cases showed a 37 per cent decrease in tooth decay activity, whereas the controls showed a 10 per cent increase. However, the unknown controls showed a decrease of 32 per cent. The findings suggest that the unconscious mind had considerable influence in deciding whether the tooth decay was active or nonactive. It indicates the need of careful and double controls for each conclusion reached.

The sputa examinations<sup>15</sup> also suggested that no definite change had been accomplished by the tablets. An analysis was made on more than one specimen from each child studied. Dr. Hartmann, Professor of Bacteriology at the University of Hawaii, used the color test to check the bacteriologic counts. We were forced to the conclusion that in the course of four months the use of one calcium fluoride tablet given daily (the present market price being \$3 per hundred tablets) had failed to influence the lactobacillus count.

Fulton stated<sup>16</sup> that less than 1000 lactobacilli per cubic centimeter indicates immunity to



Odontoclasia: A rapidly spreading surface enamel decay commonly seen in Hawaii.

tooth decay; counts up to 15,000, moderate susceptibility; the higher the counts, the greater the susceptibility. This is generally accepted as a good indication of the degree of susceptibility to caries.

The evidence did not seem to support the theory that one calcium fluoride tablet influenced tooth decay. The evidence, however, is overwhelming that children should get some fluorine, preferably as 1 part per million of sodium fluoride in their drinking water. Children who get this amount of fluorine have a caries experience rate of 240, whereas children living in cities in which the fluorine content of the water is as low as it is in Honolulu have a caries experience rate of 740.<sup>17</sup> Because of this inconclusive evidence some of the dentists are

TABLE 4

LACTOBACILLUS COUNT	FLUORINE SUBJECTS		NONFLUORINE SUBJECTS		UNKNOWN CONTROLS	
	Before Tablets	After Tablets	First Examination	Second Examination	First Examination	Second Examination
High . . . . .	87	81	25	19	18	11
Medium . . . . .	19	26	4	12	4	4
Low . . . . .	5	9	6	12	1	1

TABLE 5  
1947 ENZIFLUR STUDY

	CONTROL SUBJECTS			FLUORINE SUBJECTS			
	ST. JOSEPH	CONING. K.	WAIPIAHU	TOTAL	CONING. K.	Waiipahu	Total
DECIDUOUS TEETH							
NUMBER OF CHILDREN	A* 37 B* 45	17 11	6 13	60 69	57 53	54 66	111 119
NUMBER OF TEETH	A 732 B 869	412 219	117 252	1261 1340	1111 1005	1055 1263	2166 2268
DECAY FREE	A 385 B 411	228 118	42 100	655 629	480 356	325 365	805 721
DECAYED	A 293 B 484	143 69	63 114	499 567	529 531	577 683	1106 1214
MISSING	A 13 B 34	11 3	1 9	25 46	34 51	59 80	93 131
FILLED	A 41 B 44	30 29	21 29	92 102	68 67	84 115	152 182
ACTIVE	A 265 B 306	119 4	62 54	446 364	407 109	534 245	941 354
NONACTIVE	A 28 B 74	24 61	1 60	53 197	122 422	56 460	178 882
PERMANENT TEETH							
NUMBER OF TEETH	A 19 B 58	8 13	3 12	30 83	65 112	59 128	124 240
DECAY FREE	A 18 B 53	6 9	3 7	27 69	38 85	48 100	86 185
DECAYED	A 1 B 5	2 4	0 2	3 11	17 26	10 24	27 50
MISSING	A 0 B 0	0 0	0 0	0 0	0 0	0 0	0 0
FILLED	A 0 B 0	0 0	0 3	0 3	0 1	1 4	1 5
ACTIVE	A 1 B 5	2 2	0 2	3 9	17 5	10 23	27 28
NONACTIVE	A 0 B 0	0 2	0 0	0 2	0 21	0 1	0 22
SPUTUM COLOR TEST BY DR. HARTMANN							
HIGH	A 25 B 19	13 4	5 7	43 30	42 34	45 47	87 81
MEDIUM	A 4 B 12	4 1	0 3	8 16	12 13	7 13	19 26
LOW	A 6 B 12	0 0	1 1	7 13	3 6	2 3	5 9

A\*—First Exam

B\*—Second Exam

now using a 2 per cent sodium fluoride solution to paint the teeth three times a year after thorough cleansing. It has been shown<sup>18</sup> that this alone will reduce tooth decay by 40 per cent. However, after a thorough review of the literature, Ast cautions, "Let us be patient to await conclusive evidence before we make up our minds on the merits of fluoride therapy."<sup>19</sup>

The present popular cola drinks with a pH of 2.6 which can readily etch enamel may be an added factor in increasing the decay tendency.<sup>20</sup> This added to the mouth of children who already have a very high aciduric count,

with no protective factors such as fluoride or oxalate to inhibit the bacterial growth or to protect the enamel from the effect of acid, would be an added danger in a community where the water is low in fluoride and particularly in a climate like Hawaii which induces an increased intake of cold drinks. Acid residue food (such as rice) can produce a urine pH as well as a sputum pH of 4 to 4.5. This is an ideal medium for the lactobacilli, which are the only mouth bacilli that can thrive and produce acid down to a pH of 3.2.

To correct tooth decay by diet, the correction

must be quantitative, such as a change from large amounts of rice or bread to large amounts of taro, potatoes, or vegetables, or the optimum amount of the protective factors, must be present. The protective factors must inhibit aciduric bacteria or the enzymes, or neutralize the acid that is present. When such conditions prevail

in the mouth, there is an increased immunity to decay. Present thinking should be directed towards these protective factors, and every child should be given the benefit of this current knowledge, but further observations are necessary before complete conclusions can be made.

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# Relation of the Emotions to Physical Discomfort

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THE changes which occur in the type of medical practice which we now see and the emphasis which is laid on different diseases occurring over a long period of years add much to the interest in the practice of medicine. During my days in medical school, teaching emphasis was placed on such diseases as typhoid fever, pneumonia, scarlet fever, diphtheria, etc. Very little was said and not much was known about the disturbances of function occurring in the body as a result of emotional unrest.

In World War I the type of disease which caused the greatest concern was that resulting from infections, particularly pneumonia and influenza. In World War II we had an entirely different problem. The patient whose case is to be discussed illustrates quite well a type of psychosomatic individual whom we have seen quite commonly in the military service.

The patient, a young lady, complains of nausea and vomiting which have been present off and on since the age of five years; occasionally the nausea is most distressing, then it will be mild for a short time and frequently disappears for several months. During the years that she has had these symptoms

she did not experience any great weight loss until quite recently, when her complaints became quite distressing; in about two months she lost 15 pounds. She states that her nausea comes at almost any time, particularly if she gets excited, and that with the nausea she very frequently vomits. The nausea has no relation whatever to meals. Emptying the stomach gives some subjective relief. She rarely has any pain except that which is associated with straining while vomiting. The patient exhibits certain physical characteristics of an undernourished, apprehensive, emotional person, which is in keeping with the history of her illness.

An understanding of this young lady's history furnishes the only possible means of establishing for her a satisfactory therapeutic program and gives the only possible approach to helping her solve her own difficulties. She is now 25 years old. She was born and raised in a small town near Chicago. Her parents are good people, although her heredity is none too good; her mother had a nervous breakdown at one time. The girl's own life has been not very happy. She was quite well until she was five years of age, at which time she was forced to have a sexual experience with a member of her own family. There was a recurrence of this on six or eight occasions, or until she reached the age of seven years. Following her first experience she de-

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veloped nausea, later vomiting, which gradually increased; at times the vomiting became so marked that she lost some weight. After the age of seven the sexual insults ceased, and no further experiences of this kind occurred until she was eighteen years of age, when similar episodes were forced on her through contact with another person unrelated to her.

The sexual experiences, in which she more or less unwillingly participated, were without gratification. After several of these latter episodes she again began to suffer with nausea, vomiting, and sufficient weight loss to cause her and her family some concern. However, with the cessation of visits from the male friend she gradually recovered, and there were no more such experiences until she was 20 years old. From the age of 20 to 21 she was forced by a boy friend to submit to sexual intercourse at frequent intervals, and such episodes were followed by the same emotional patterns as those which had occurred in the past, except that now after each sexual experience she also suffered lower abdominal pain. To relieve this pain her appendix was removed but the operation did not effect any permanent benefit.

However, about two years later, at the age of 23, she met a boy friend who became interested in her to a certain extent, and who as she says, was more considerate than some of the others. The girl indulged in intercourse with this new friend in order to satisfy him. She still maintained an impassive attitude but without the objections she had formerly experienced, undoubtedly because of the friendly interest and at times expressed devotion of this particular boy friend, and also because he was interested in helping to solve some of her problems, particularly those relating to her family. The last experiences during this particular period with the boy friend did not provoke any particular nausea or vomiting; nor did she have any considerable amount of abdominal pain.

She progressed reasonably well until January of 1942, when the boy friend was inducted into the Army. Since this separation she has been lonesome and without any great amount of sustained interest in anything, although she has had many different types of employment. She tried to be a nurses' aide, and also worked in a hospital for the care of the



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tubercular. She has changed jobs on frequent occasions, never being able to stay at any one for any considerable length of time because of persistent nausea and occasional vomiting.

THE most recent attack began with renewed vigor, resulting from a rather acute emotional upset. Since then she has been nauseated, has vomited most of her food, and has lost 15 to 20 pounds in weight within a month or six weeks.

In order to evaluate the patient's complaints of nausea, vomiting, and weight loss, she has been most carefully studied from the physical standpoint. She has received a careful examination, including x-rays, laboratory, and chemical studies, none of which revealed any evidence of an organic disease. Her stomach is perfectly normal. The small intestines show nothing abnormal. The large bowel is quite normal except for a moderate amount of spasticity. The blood examination is entirely normal. She does show a moderate amount of fibrosis in the lung fields, but there is no evidence of an active tuberculosis. The heart is perfectly normal in size, shape, and position. The basal metabolic rate is normal. All the examinations that could be

made, both physical and with the help of the laboratory, demonstrate her to be quite healthy except for an underweight condition and the evidences of emotional instability.

The next question which concerns us is what kind of a girl is she? And of just what kind of material is she made? In studying patients of this type it is just as necessary to know what kind of a patient has the complaint as it is to know what kind of disease the patient has. Unless we are able to answer these questions it is almost impossible for us to establish a satisfactory method of treatment.

In order to answer the latter question let us go back and look into the family history and into her family life. We find that her family consisted of her father, mother, and four siblings. She is the oldest and doesn't get along particularly well with the other members. Her mother says she is like her father, undemonstrative and a little peculiar, and between the father and the daughter there was a considerable amount of friction. Her mother is more or less partial to her younger sister, who is good looking and affable. The patient feels that she is more or less out of the family picture.

Of considerable importance in reconstructing her emotional life is the fact that her father died in the early part of 1944 and that following his death, the patient showed not the slightest reaction whatsoever. The patient has felt all along that she must assume a considerable amount of responsibility for the family's welfare. She had to help her mother in doing the housework and in caring for the other children. She has also felt that although she has done a considerable amount of work and rendered a great deal of financial help towards taking care of the family needs, her efforts are not appreciated. What she has done was her duty, without appreciation or thanks from the other members of the family group.

This résumé gives you a general picture of the problems with which we have to deal in this case. The girl came under the care of Dr. Elsie Haug at her family physician's recommendation because she had been vomiting for such a long period of time and had suffered such an extreme weight loss that the members of her family had become uneasy about her. The patient volunteered the further information that since she had become so weak

she dreams a good deal. All her dreams are more or less tragic, having to do with death, drowning, and other experiences of a similar kind. Curiously enough, certain colors, odors, and noises precipitate vomiting. Brown colors always nauseate her, and she cannot eat foods that have a brown color, such as gravies and chocolate in any shape or form. Noises, particularly if they are loud and sudden, will always bring on an attack of vomiting.

THE patient exhibits certain reactions resulting from many types of psychic trauma. We see, first, a girl born into a household which is not too congenial. The father and mother were evidently at odds. Her inheritance was none too good since her mother had had a nervous breakdown. Being the oldest of the children, the patient felt a tremendous family responsibility, which she apparently assumed because it was in line of duty. Then followed, beginning when she was 5 years old, psychological and psychic insults with which she tried to cope without help either from the family or from others. These resulted in the development of various escape mechanisms which might justify or excuse her conduct, and finally came the triumph of the emotions in a general hodily upheaval, bringing the patient to us in her present state.

Help may be obtained in unravelling cases with such an emotional background as this by employing sodium amytal or similar drugs to bring into the open many problems buried in the subconscious mind. The use of sodium amytal in this case was most helpful in uncovering many of the details of the patient's past life which have already been given you.

Many years ago Cannon, his co-workers, and others demonstrated that hody changes taking place in animals and in man, as a result of pain, hunger, fear, rage, and sexual excitement, correlate with changes occurring in the tension of the smooth muscle of the body, but in particular with that part in the gastrointestinal tract. This particular patient exhibits one of the most outstanding examples of what we would call, if you want a name for it, anorexia nervosa.

As a result of the extremely distressing type of psychic trauma which this girl had in her early

years, the autonomic nervous system has been made to feel excessive and unusual varieties of stimuli which have been thrust upon a person not too well suited for such experiences—experiences that have to do with sexual intercourse with men, with related colors, such as brown, and also with noises. Either one of the latter two experiences can precipitate an emotional stimulus which, through the activity of the sympathetic nervous system, induces an undue tension in the smooth muscle of her gastrointestinal tract. The stomach becomes extremely irritable, and as many of you know who use the fluoroscope in examining the stomachs of nervous people, the moment the barium meal enters this organ there frequently begins marked peristaltic activity; in those who have nausea we observe a wave beginning in the pars media of the stomach extending towards the fundus and towards the pyloric end and according to the violence of these waves there begins an uncomfortable sensation of nausea, or regurgitation of the meal into the esophagus, sometimes producing vomiting.

Along with disturbances such as this, these people often lose their appetites and suffer with abdominal discomfort which they describe as gas, or fullness in the epigastrium, and pain in the abdomen. This type of slow, nagging pain, which is so frequently observed in patients, has been interpreted as being due to chronic appendicitis, gallbladder, or various other physical defects, and these individuals are subjected to operative procedures which occasionally afford temporary relief.

Associated with these changes in the smooth muscles there are other disturbances of body functions which take place. There is an increase in the pulse and respiratory rates, in the blood pressure, and in the blood sugar. These are well-recognized physical reactions to an emotional stimulus which begins in the brain and is transmitted through the sympathetic or parasympathetic nervous system, not only to smooth muscles but also to the glands of internal secretion, affecting the pituitary, the thyroid, the pancreas, the gonads, and the adrenals.

This patient exhibits certain suggestive evidence of such an endocrine disturbance related to her emotional imbalance. Within the past two or three years the menstrual periods have shown definite changes; while still regular there has been a very

considerable decrease in the amount of the flow. Many of you may recall patients who have developed hyperthyroidism as a result of emotional stress or strain. As a matter of fact, if one looks carefully and inquires into the personal history of practically every patient who shows any marked evidence of hyperthyroidism, it will be fairly easy to find an emotional upheaval which precipitated the thyrotoxicosis. We have seen patients with diabetes mellitus in whom emotional stress or strain either aggravates already existing glycosuria or precipitates its development.

As Honorary Consultant to the Surgeon General of The United States Navy, I had an opportunity of observing, during an official visit to the various United States naval hospitals on the West Coast, a goodly number of patients who were returned to this country with all the symptoms, the physical signs, and clinical findings of diabetes mellitus. These men on their arrival at our hospitals from foreign duty were taking from 20 to 50 units of insulin a day; after being in our hospitals and in more familiar surroundings, and being given an adequate diet, it was observed that many of them could reduce the amount of insulin taken, and some dispensed with its use altogether, resuming a general diet without showing glycosuria or hyperglycemia. Not all of them fall into this category, however, and it is possible that some who apparently recover from diabetes may later develop the true disease, even though at the time the insulin was discontinued there was no evidence whatever of their former trouble. It is also interesting to note that all those who showed this type of behavior had severe and unusual emotional experiences.

WHEN the diagnosis is made and when the type of patient who has the disease is understood, the next problem that arises is, what can we do to help these patients? This is the problem which faces us not only with this girl but with hundreds of others. I am not a psychiatrist but I am a psychologist, and I believe I know how to talk common sense to people who have diseases of the type shown by this patient. It is possible to help her a great deal, as has already been clearly demonstrated, in that during a month of treatment she

has gained 10 pounds in weight and has a different outlook on life.

One of the greatest mistakes a physician can make is to tell this type of patient, "You haven't anything so much the matter with your stomach and intestines. All you need is to get something to do and you will snap out of it." Such a statement as this immediately lets the patient know that you, as the physician, are not familiar with her case, and she feels that you can be of little help in overcoming many of her objective symptoms which she has interpreted in terms of serious organic disease, because you lack a true understanding of just how she feels. The first step then in treatment is that you have a complete understanding of the patient and that the patient has confidence in the doctor who is willing to listen to her story and who will carefully plan a course for her to follow in seeking health.

THE next step in such a rehabilitation program is to explain to the patient how her symptoms developed from this particular type of reaction, and to tell her that the symptoms of nausea and vomiting, fullness, abdominal discomfort are not caused by an ulcer in the stomach, by any disease of the gallbladder, by an infected tube or ovary or an appendix, or by any other disease in the abdominal cavity, but result from the fact that the stomach—which is composed of smooth muscle and which normally contracts in order to empty itself of its contents—has become extremely irritable from impulses constantly coming to it through the sympathetic nervous system, beginning in that portion of the brain which controls the normal action and behavior of the stomach, intestines, and large bowel. Through the emotions this controlling center tends to become either stimulated or depressed by impressions or suggestions of such nature as would bring to her subconscious mind any of the psychic trauma which she originally experienced. An immediate stimulus through the autonomic nervous system is transmitted, in an exaggerated manner, to her stomach which in turn causes it to go into a state of tension, and through this tension she experiences the different sensations of which she complains.

Then explain to her that she very soon will be able to recognize the beginning of these sensations before there is nausea, and since she understands the mechanism of its workings she no longer needs to be afraid of consequences that arise. She should say and believe that she is sufficiently well acquainted with these stimuli to remark, "Oh yes, I know what produces these sensations. I recognize the fact that I am nauseated, and I know that I might be that way for a short while, but it isn't going to down me, and I am going on with something else. I can overcome it and I will do so by developing a normal reaction to that which occurs in a normal mind and body."

I would also explain to her that because she has these various symptoms, the natural thing for her to do is to interpret the discomfort which she has in terms of her actual experiences. In other words, she commonly hears that anyone who has pain in the stomach, nausea, vomiting, and loss of weight probably has cancer. Sooner or later she develops the idea subconsciously that she has cancer, because she hears so much about it and as soon as she is convinced that she has misinterpreted these experiences through which she is going, then she has a fair chance of reconciling her thoughts with the explanation which is given her, and she begins on the road to recovery.

In closing, may I leave this thought with you in regard to this particular girl. First, the type of response which she has exhibited to emotional stimuli is a more or less common pattern. In other words, she has developed a behavior pattern in response to emotional stimuli which is more or less characteristic. To do her the most good we must destroy this pattern; she must be taught how to overcome it and how to remodel her life so that these emotional upsets will not recur. Such an accomplishment cannot be brought about with the use of drugs. It cannot be accomplished by performing many or various surgical procedures. It can't be done by telling her there is nothing the matter with her. You can help by sitting down and discussing her problems with her, by explaining them to her, and by assuring her that while such a method of treatment is going to take time, she will be amply rewarded in the end by being able to resume a normal, healthy, productive life.



## An Obscure Anemia

FROM NICHOLS VETERANS ADMINISTRATION HOSPITAL\*

HAROLD GORDON, M.D., EDITOR

### CLINICAL ABSTRACT

**T**HE patient, a 51-year-old white male, was admitted March 17, 1947, because of profound weakness, numbness, and a tingling sensation in his extremities. These symptoms had appeared eighteen months before, when he was hospitalized elsewhere for "yellow jaundice" and was told that he had "anemia." The onset of his illness is quite vague, but apparently he has not been able to work since June 1946. Before that, he often had to take time off because of generalized weakness. He says he has been jaundiced many times (every three or four weeks) during the last fourteen years, but his history is not very reliable and he is unable to give details concerning the jaundice. Apparently the icterus was not accompanied by nausea or vomiting. He states that he has had fleeting, sharp precordial pain for fourteen years, and blurring vision, headaches, and transient edema for six to eight years. He had many infectious diseases during childhood, and has had three attacks of pneumonia during adult life. He has no complaints referable to the gastrointestinal tract.

He worked at an ammunition depot from 1943 to June 1946 (forty months), handling "Yellow D" and T.N.T. About four months after starting this work, he developed intense jaundice and claims his urine became dark yellow. He says he had re-

current attacks of jaundice afterwards and was very yellow when hospitalized in July 1946. He was kept in the hospital until the end of August, when he left unimproved. Afterwards he remained at home, never entirely well. He received "shots" while in the hospital and also some "pills." He says he lost weight and now weighs 154 (usual weight 200 pounds).

When admitted he appeared well nourished but chronically ill. His temperature, pulse, and respirations were normal. Blood pressure was 132/80. His skin had a slightly lemon-yellow tint. His tongue was smooth and reddened. His mucous membranes were pale. He had a soft systolic murmur, which was heard best at the apex. Vibratory sensation was absent in all extremities. There were no other abnormal sensory changes. Position sense and reflexes were normal, as were his vital capacity, venous pressure and circulation time. His liver and spleen were not palpable, and he had no palpable or visible masses in the abdomen. No free acid was present in the stomach contents, even after stimulation with histamine. Reticulocyte counts were as follows (in per cent): March 21, 1.9; March 22, 1.2; March 24, 2.3; March 25, 0.7; March 26, 2.5; March 27, 2.2; March 30, 3.4; March 31, 3.5.

On March 25, platelet count was 114,400; the icterus index was 6 units; and the Van den Bergh, direct, negative, and indirect, trace. On March 26, platelet count was 120,130. Hematocrit, March 20, was 26 per cent; mean corpuscular volume, 105 cu. micra; mean corpuscular hemoglobin concentration 32.5 per cent. On March 26, these values were 39.5 per cent, 134 cu. micra and 27.5 per cent, respectively. Fragility test (March 20): hemolysis began

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at 0.42 per cent and was complete at 0.28 per cent saline concentration (normal control, 0.44 per cent and 0.34 per cent, respectively). Morphologic studies of several blood smears showed considerable macrocytosis with slight anisocytosis, moderate poikilocytosis, and occasional polychromasia. The neutrophilic leukocytes showed polylobulation.

Sternal puncture (March 17) showed increased cellularity of the marrow, with an absolute increase of erythroid cells and an increase of macronormoblasts and megaloblasts. The myeloid cells were diminished, but not remarkable otherwise, and bone marrow giant cells were plentiful. Blood Kahn was negative.

phology of the erythrocytes. Wintrobe, in his textbook on hematology, has grouped the anemias as macrocytic, normocytic, or microcytic. Others classify them as due to deficiencies of blood-forming substances, to disturbances in the marrow, or to hemolytic processes. I prefer a broader classification, based upon the pathologic physiology—anemia due to iron deficiency, to E.M.F. deficiency, to myelophthisic disturbances, to hemolysis, or to hypoplasia of the bone marrow. This classification considers the causes of the anemias and provides a clue to their management.

Applying the five possible mechanisms indicated above to this particular patient, we must decide

## LABORATORY REPORTS

	R.B.C.	Hb. (gm.)	W.B.C.	DIFFERENTIAL	
				Neutros. (Pct.)	Lymphs. (Pct.)
March 17.....	3.57	9.5	7,000	54	46
March 20.....	2.47	8.5	6,700	53	46
March 26.....	2.93	10.5	8,100	47	46
March 31.....	3.56	11.0	7,300	33	67

**Course**—The patient received 30 units concentrated liver extract (Lederle), intramuscularly, on March 20 and 15 units on March 26. To date (March 31), there has been no obvious clinical or symptomatic improvement.

## DISCUSSION

DR. BEARD: Did he have a gastrointestinal series?

RESIDENT: Yes. It was normal.

DR. BEARD: Clinically, this patient presents changes typical of Addison's pernicious anemia. He has the blood count, the color, the tongue changes, the neurologic manifestations—everything except the history. I talked to him a few minutes ago. He insisted that he had "yellow jaundice" frequently during the last fourteen years. He told me he became "yellow all over" and had light-colored stools, but no indigestion during those attacks. That is significant from the standpoint of diagnosis. Perhaps I can make that clearer by considering the anemias in a general way first.

I classify the anemias according to the *mechanism* involved rather than according to the mor-

whether he has a deficiency of E.M.F., whether he has chronic hemolytic anemia, or whether he has both. The differentiation of the two, by examining the bone marrow, is not always easy. In both types the marrow is hyperplastic, with a definite "left shift" of erythroid cells. The immaturity of the erythroid cells of the marrow is not as marked in chronic hemolytic anemia as in anemia caused by E.M.F. deficiency. In both conditions, however, the erythroblasts and megaloblasts are increased. But there is this difference—in chronic hemolytic anemia the *serial maturation* of the erythroid cells is not interfered with, so the marrow contains megaloblasts, erythroblasts, and normoblasts in approximately normal proportion, though in increased number, whereas in the anemia of E.M.F. deficiency, megaloblasts and erythroblasts are proportionately and absolutely more numerous than the normoblasts. In chronic hemolytic anemia the marrow shows regenerative hyperplasia of erythroid elements, and in E.M.F. deficiency there is a "maturation arrest" of the erythroid cells.

Clinically, patients with chronic hemolytic

anemia present a history of moderate anemia usually with recurrent attacks of jaundice over a long period of time. Acute hemolytic anemia is relatively easy to recognize; chronic hemolytic anemia may on the other hand, present quite a confusing picture. The latter condition causes some anisocytosis and poikilocytosis, and also occasionally macrocytosis of the red blood cells.

This patient shows nothing to substantiate a diagnosis of chronic hemolytic anemia. He has no splenomegaly, and we expect the spleen to be palpable at least. He has neither clinical or laboratory signs of jaundice. I have seen cases without jaundice, but they are rare. When he was admitted, his reticulocyte count was only 1.5 per cent. In my experience, reticulocytosis is even more of a cardinal sign than severe jaundice. All in all, then, I think we can rule out chronic hemolytic anemia and have to fall back on E.M.F. deficiency as the cause of his anemia.

Now E.M.F. deficiency may develop in any one of several ways. Faulty nutrition can be ruled out immediately on the basis of the patient's general appearance and his dietary history. Sprue can be eliminated with equal readiness. This leaves true Addisonian anemia and the so-called achrestic anemia. He did not respond to specific therapy the way most patients with Addison's anemia do, so he falls in the group called "refractory anemia."

Refractory pernicious anemia is a very interesting condition, but unfortunately no one knows very much about it. These patients have a marrow which, as far as I'm concerned, is indistinguishable from that seen in the usual case of pernicious anemia. It shows a definite megaloblastic arrest. Many of the patients have neurologic changes identical with those seen in pernicious anemia. Most of them have no hydrochloric acid and are histamine refractory. They have all the signs and symptoms of pernicious anemia, except that they don't respond to liver therapy. The current literature has many references to this type of anemia, and it has been claimed that folic acid therapy will cause a satisfactory remission even when liver has no effect. Dr. Gordon and I were discussing that point, and he remarked that this patient, having been hospitalized some months ago, must have received adequate amounts of folic acid in his

diet. I think that that is true and that if this man should respond to folic acid, he will probably require an enormous amount of it.

From the point of view of diagnosis, then, we have to classify this patient in the group of E.M.F. deficiency anemias. He has all the clinical and laboratory changes necessary for that diagnosis. He lacks only the ability to respond to specific therapy, so we have to place him in the special sub-group of "refractory pernicious anemia."

I WAS asked to say something about the management of patients with pernicious anemia. There is good evidence that the average human liver contains about 300 units of E.M.F. Unpublished experiments performed by Dr. Carl Moore of St. Louis show that about 85 to 90 per cent of large doses of liver extract is stored by the liver, both in normal and in anemic individuals. These two observations are important from the point of view of management of patients with pernicious anemia.

Our objective is to return an anemic patient to normal as rapidly as possible. Therefore, it is my practice to give one unit of E.M.F. per day, according to the recommendation of the Standardization Committee, plus about 300 units for reserve storage in the liver. In one case we were able to show that approximately 85 per cent of the extract is stored in the liver. We gave one patient 300 units of liver extract in one dose. Her blood remained perfectly normal for about nine months, without additional therapy. Then her red blood cells started to decrease, so we placed her on the standard dosage of 30 units a month and maintained her in excellent balance on that as a maintenance dose. That is pretty good evidence that she was able to store E.M.F. and to call upon it according to the needs of her body.

As far as we know, the bone marrow is not primarily at fault in pernicious anemia. It is merely altered for lack of the E.M.F. stimulus. Accordingly, it probably does not matter appreciably how the dosage of the liver extract is spaced, provided the patient receives a total of 300 units, plus the additional amount necessary to cover the hospitalization period. It may be given at the rate of 15 units a day, up to 300 or more units, or it may be

given at a rate of 30 units a week until the same total amount has been administered. It is largely a matter of convenience—the convenience of the patient and that of the physician. After a satisfactory total has been given, the patient merely needs a maintenance dose.

Obviously, it is essential to give an active extract. The highly refined extracts are very satisfactory. At one time it was felt that the relatively crude extracts contain substances of special value for patients with neurologic changes. That is no longer the general consensus—it is simply a matter of making an early diagnosis and of maintaining adequate therapy with a potent extract.

As to the value of folic acid in treating Addison's anemia, I do not like it as well as I do liver extract. It has only one advantage—ease of administration. A serious disadvantage is that it does not arrest or cure any neurologic changes. The current literature shows that fact very definitely, even though some patients do respond satisfactorily both neurologically and hematologically. There is also a psychologic factor: If you start a patient on folic acid and don't get a good response, it may be difficult to persuade him to change to liver therapy, because it is so much easier to take a pill than to submit to hypodermic medication.

In my opinion, folic acid is valuable chiefly in the very rare cases of sensitivity to liver extract, and as an adjunct to liver, so that the latter does not need to be given quite as frequently. Perhaps, also, folic acid therapy may have a definite place in the very occasional case which proves to be refractory to liver extract. In general, patients with pernicious anemia respond so exactly to the calculated dose of 1 unit of liver extra daily that other therapy is seldom indicated.

IT WILL probably be necessary to "feel your way" in the management of this particular patient. We see refractory cases occasionally. Recently I had a patient whose clinical picture was very similar to this one. The reticulocyte response to liver was only 2.0 per cent in eight days. After eight more days on liver, plus 30 mg. of folic acid, his reticulocyte count was only 3.5 per cent. His erythrocyte count, however, is improving, just as

is the patient's whose case we are discussing. In fact, the two cases are very similar; they differ in only one respect. The man we are discussing has slightly more manifest neurologic lesions. Both have a normal leukocyte count instead of a leukopenia, such as is usual in Addison's anemia.

Some years ago we had a patient who was diagnosed by Dr. Gordon as having "pernicious anemia of pregnancy." However, her anemia persisted after her child was born. I saw her regularly after Dr. Gordon went into the service. She never responded satisfactorily and eventually died in spite of receiving large doses of liver extract for more than four years. I don't know why these patients do not respond and no one, to my knowledge, has offered a satisfactory explanation.

DR. GORDON: When this patient was selected for discussion, I felt that he was a classical example of Addison's anemia. When I asked Dr. Beard to speak, I was so sure of the diagnosis that I suggested he should devote time to a general discussion of the management of patients with pernicious anemia. As it turned out, this patient failed to respond to liver therapy, the way most patients with pernicious anemia do. However, his atypical response has been to our advantage today, since it helped to channel the discussion into a consideration of the management of refractory macrocytic anemia, and the place of folic acid therapy. Smears of the sternal marrow and of the peripheral blood show morphologic changes characteristic of pernicious anemia. The erythrocytes are macrocytic and show poikilocytosis and anisocytosis.

The sternal marrow is hyperplastic, with the increased cellularity due to maturation arrest of the erythroid cells. The leukocytes are polylobed. He did not respond to liver therapy the way we expected. I have no more idea than Dr. Beard has, why liver has been ineffective. As you know, the expected reticulocyte response depends on the initial erythrocyte count. This was shown years ago by Castle and his co-workers. It is not necessary to carry the figures in your head, but for those who like to do so, memorize the figures 8, 5, 4, 3, 2, 1, and  $\frac{1}{2}$ ; multiply these by the factor 7, and you then have the expected reticulocyte count for initial erythrocyte counts of 1, 1.5, 2, 2.5, 3, 3.5, and 4 million, respectively.

In view of what has been said, I'd like to ask Dr. Beard to tell us how these refractory cases respond to massive doses of liver, say a very large initial dose and subsequent amounts of 15 units twice weekly; also, how they respond to a combination of liver and reticulin.

DR. BEARD: I don't believe it is possible to predict how a particular patient will react. Accordingly, I believe it is good practice to try different combinations of therapy. It will be interesting to see how this man reacts to a combination of folic acid and liver, or a combination of liver and reticulin, perhaps even a combination of all three.

DR. GOTT (Chief of Medicine): I am greatly interested in what Dr. Beard has told us about recent investigations regarding the amount of E.M.F. necessary to saturate a depleted liver or, if you prefer, a depleted individual. Up to now, in trying to regulate the amount of therapy, we have been guided largely by the reticulocyte and erythrocyte responses of each patient. I never could see any advantage to giving daily injections, when equally satisfactory results could be obtained by therapy at less frequent intervals and it is much more convenient for the patient. It has been my practice to inject 30 units and have the patient return twice during the first week for a checkup. Patients with pernicious anemia improve subjectively, even be-

fore there is an adequate red cell response. This improvement is dramatic and even diagnostic. At the end of a week, after repeating the necessary laboratory studies, I inject another 30 units and instruct the patient to return once weekly. I continue injecting 30 units each week until the erythrocyte count is maintained at a satisfactory level. Then I give him a maintenance dose of 30 units every two to four weeks.

As to this case, I am not sure that he is suffering from pernicious anemia. His leukocyte count is out of line and he is not responding in a typical manner to liver therapy. However, he has shown some response. If we assume that his admittance erythrocyte count was two and a half million—and that, according to our present information was probably correct—he has, after two weeks' therapy, a count of approximately a million more. That is not a bad response, so I propose to continue him on a dosage of 30 units twice a week until we have observed him long enough to see if he fits into the pattern of true pernicious anemia. Later, if indications arise, we may give him iron or folic acid. It will depend entirely on his general progress, on his clinical status, and on the results of continued laboratory studies.

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### RUTIN STUDY GRANT MADE

A RESEARCH grant for the study of rutin has been made to the University of Nebraska by The Smith-Dorsey Company, according to a recent announcement. The work will be under the direction of Dr. Harry Miller, director of the University's chemurgy project, a division of the College of Agriculture.

Dr. Miller intends to select varieties of buckwheat which are high in rutin content and conduct plant breeding studies in an attempt to develop a superior strain. He also intends to try a new method of extraction of rutin from the buckwheat plant.

## TECHNIC OF THE OPERATION

# For Free Composite Grafts of the Nipples in Mammaryplasty

*A Scientific Exhibit from William Milton Adams, M.D.,  
Memphis, Tennessee*

The nipples and areolae may be dissected free under local anesthesia, thus reducing the time of the general anesthesia for amputation and shaping of the breasts, or, the breasts may first be amputated under general anesthesia and, while the remaining tissue is being shaped and the graft beds are being prepared, the nipple grafts may be dissected from the amputated portions of the breasts by an assistant. The latter method is preferable, in that less time is consumed in the operation. After the breasts are amputated and the incisions closed, the general anesthetic is discontinued and local anesthesia is used for preparation of the recipient areas and application of the grafts.

In estimating the amount of breast tissue to be excised, the age of the patient and the size and shape of the entire body should be taken into consideration. Parallel semilunar lines of incision are marked on the posterior and anterior surfaces of the breasts. The lower incisions are placed along the inferior margins of the submammary folds; if placed above the folds, they will be plainly visible after healing takes place. If the breasts extend into the axilla or laterally onto the chest wall, the lower incisions are carried upward into the subaxillary region, or lower down so as to be covered by the patient's brassiere.

The patient is then placed in the sitting position, in order to permit one to mold the contour of the breasts properly and to observe their position on the chest wall. When the shaping is completed, the subcutaneous tissues are brought together and sutured with No. 00 plain catgut. It is important that the subcutaneous tissues be closed snugly; in the event of liquefaction of the fatty tissues beneath, this prevents exudation of oil through the skin margins and possible separation of the incision. If necessary, the shape of the breasts may be materially altered by the use of retention sutures of No. 0 plain catgut through the mammary tissue itself. The skin is closed with interrupted sutures of No. 1 Deknatel placed about one-half inch apart, and a continuous suture of No. 000 Deknatel silk.

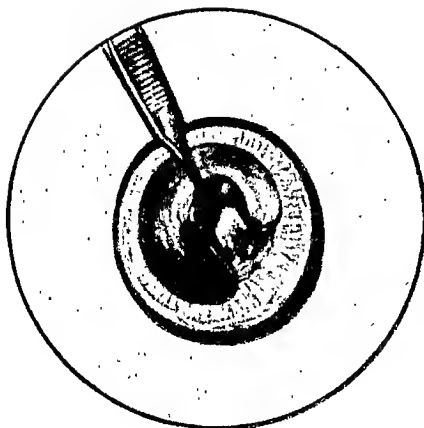
In all hypertrophied breasts, the areolae are also abnormally large, in some cases being as much as 5 inches in diameter. After the proper size is determined, dissection is begun at the periphery of the areola and carried toward the nipple as a free full thickness skin graft. As the nipple is approached, the dissection is gradually carried deeper to include a small amount of the smooth muscle tissue. Beneath the nipple itself, the incision is carried upward toward the surface in saucer fashion, to avoid making the graft too thick at this point. The nipple portion of the graft should be at least one-eighth inch thick in order to include a part of the smooth muscle tissue; it is not recommended, however, that any part of the graft be more than one-fourth inch in thickness.

The unused portion of the areolae of the amputated breasts are dissected free, wrapped in vaseline gauze and cellophane, and stored in the refrigerator for use in the event the nipple grafts themselves fail to take. One may use refrigerated skin grafts as late as ten days or two weeks postoperatively, with reasonable assurance of a satisfactory take. Although we have never lost a nipple graft, it is well to keep the additional areolar tissue as a precautionary measure.

After shaping of the remaining breast tissue is complete and the submammary incisions are closed, the patient is again placed in the sitting position and the sites for the nipple grafts are chosen. Recipient areas corresponding in size to that of the grafts are outlined, and the enclosed skin is dissected free to include almost the full thickness of the skin. One should avoid carrying the dissection so deep as to expose the subcutaneous fatty tissue, as this makes a poor surface for free grafting. The basal layer of the skin, having a rich blood supply, makes an ideal bed for the graft.

The nipple and areolar graft is evenly distributed over the recipient site and fastened in place with four diametrically opposed sutures. A continuous suture is then placed around the periphery. To insure perfect contact between the graft and its bed, and to prevent slipping of the graft and oozing of blood or serum from beneath, the entire nipple and areola are quilted to the basal layer of the skin with several rows of running stitch sutures. A dressing composed of one layer of rayon or vaseline gauze, a layer of dry gauze about one-eighth inch in thickness, and a layer of soft rubber sponge about one-fourth inch thick is placed over the nipple, the part of the rubber sponge which is directly above the nipple being saucerized to prevent undue pressure upon this elevated portion of the graft. Another thin layer of gauze is laid over the rubber sponge, and this part of the dressing is held in place with elastic adhesive. Layers of fluffy gauze are then applied over the entire breast and secured by an ace bandage around the chest. Part of the bandage should be carried over the shoulders to give an uplifting support. The importance of proper bandaging cannot be too strongly emphasized, since the success of the operation largely depends upon its application.

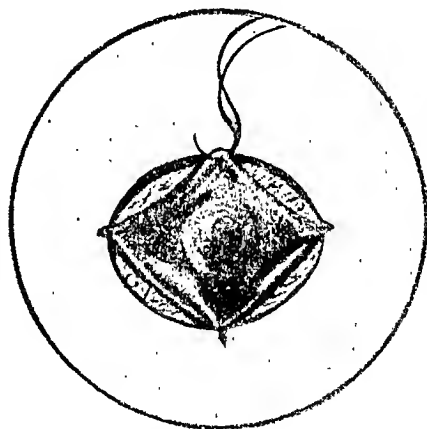
As a precaution against stitch scars, the large dressings and the submammary sutures are removed after six or seven days. Unless some complication arises, the dressings over the nipple grafts should not be disturbed for ten or twelve days.

*Left*

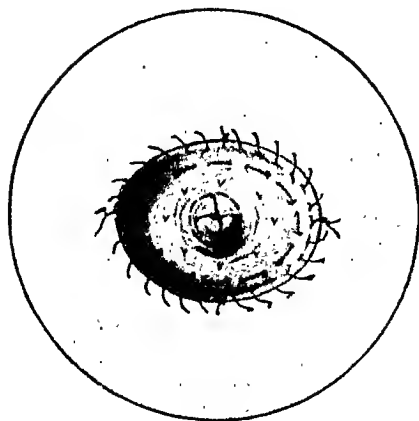
Illustrating the dissection of the nipple and areola including a portion of the smooth muscle of the nipple.

*Right*

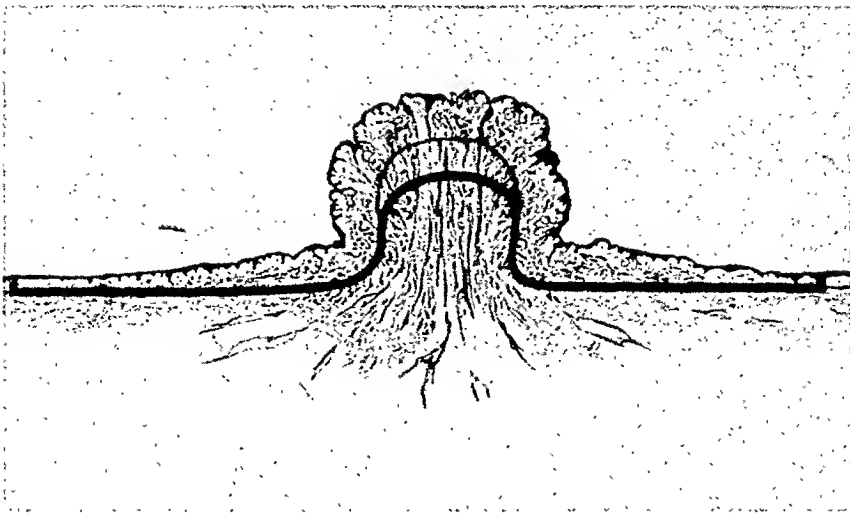
First step in the application of the nipple and areolar graft to its new location. Four retention sutures are used to insure an even distribution of the graft.

*Left*

Technic used in suturing the graft to its new site. A simple continuous suture is placed around the periphery. The central portion is quilted to the recipient area by running sutures.





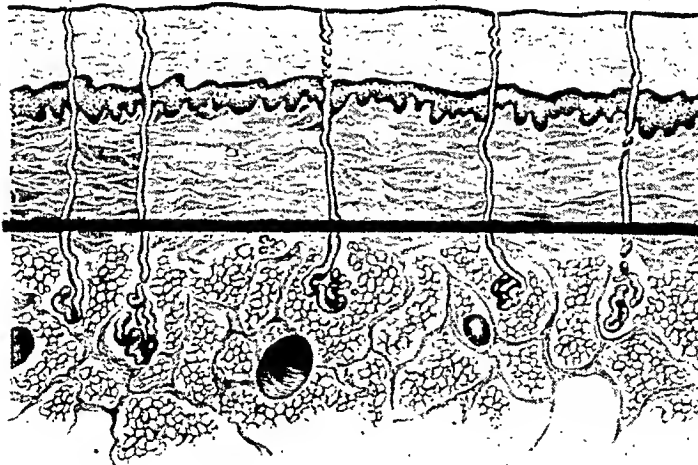


*Above*

Incisions for removal of nipple and areolar grafts. The heavy line represents an incision approximately  $\frac{1}{4}$  inch from the surface; this includes the maximum amount of smooth muscle which one should attempt to graft with the nipple. The lighter line represents an incision at a depth of  $\frac{1}{8}$  inch which includes the minimum amount.

*Below*

Line of incision for preparation of the graft bed. The basal layer of the skin is conserved in order to provide a rich capillary blood supply for the grafts.



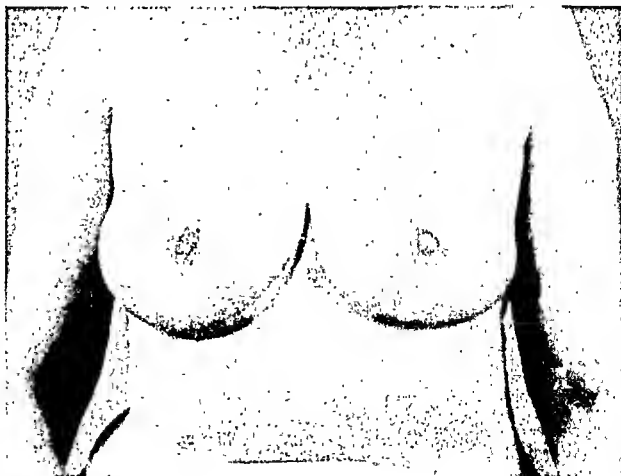


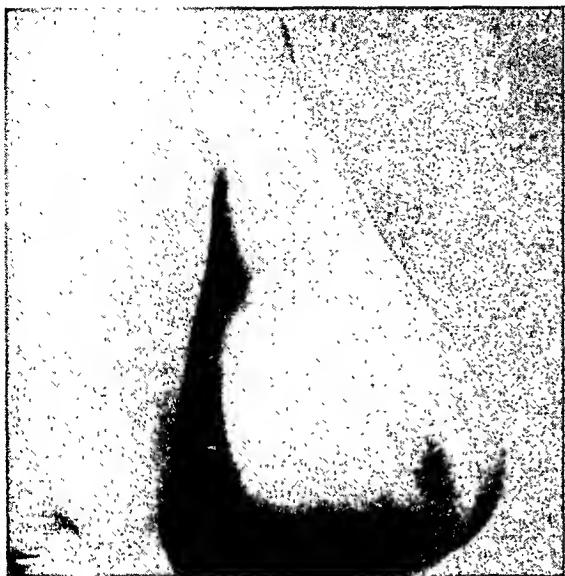
*Above*

Enlarged pendulous breasts in a woman 44 years of age.

*Below*

One year after one-stage mammaryplasty with free transplantation of the nipples and areolae.

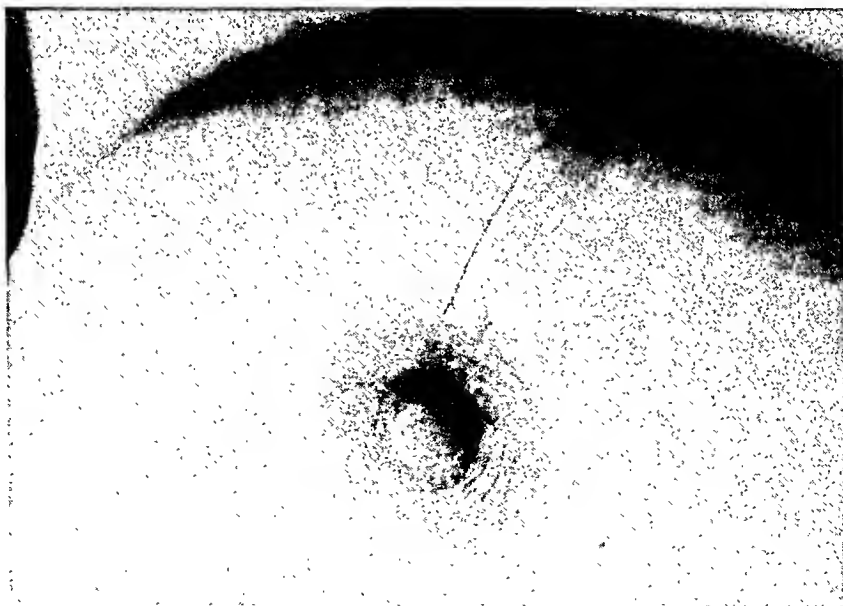




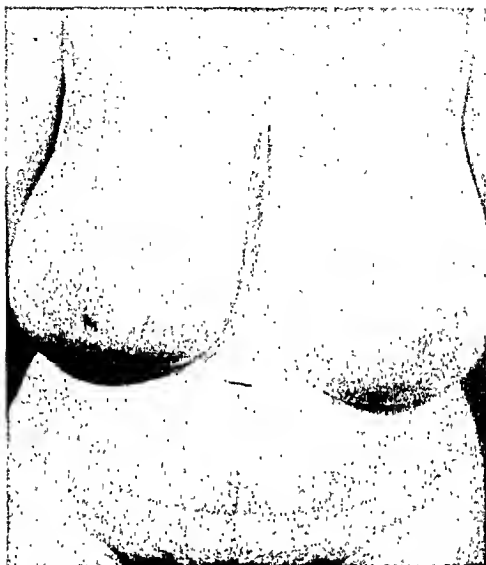
Side view. Preoperative.



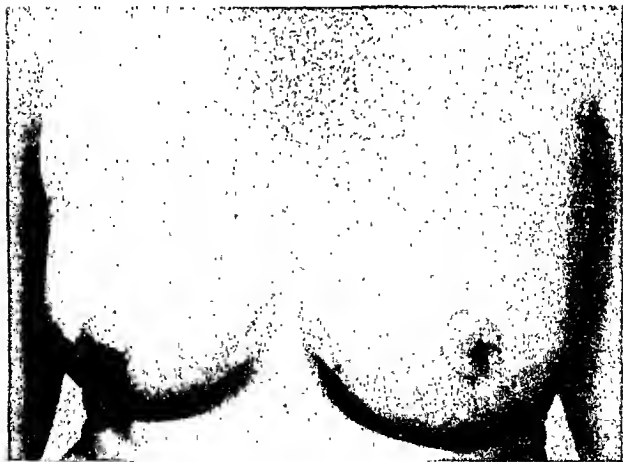
Side view. Postoperative.



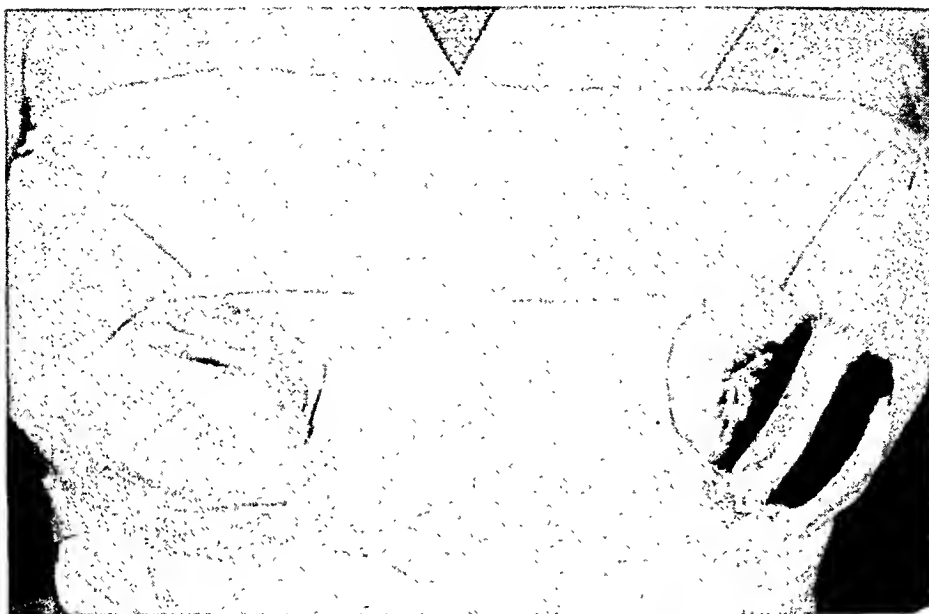
Photograph of the transplanted nipple emphasizing the normal appearance of the nipples and areolae as to texture and form. Without exception all transplanted nipples have had a return of nipple sensation and a return of function of the erectile smooth muscle of the nipple.



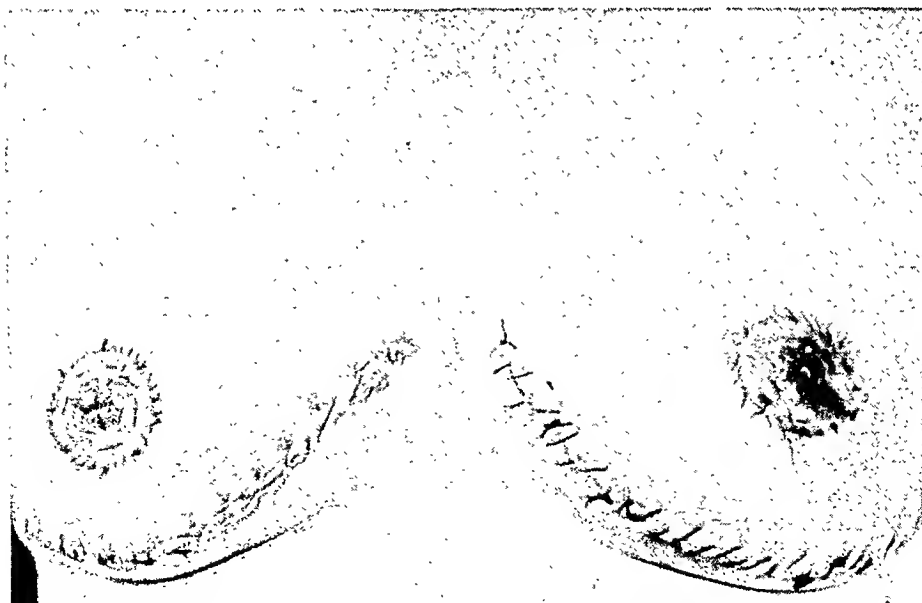
Extremely large pendulous breasts extending down below the umbilicus. Patient 40 years of age.



One year after one-stage mammaryplasty with free transplantation of



Window cut in first postoperative dressing on the tenth day to illustrate how the nipple grafts are dressed from the skin out. (1) Layer of vaseline gauze or rayon. (2) About  $\frac{1}{4}$  inch thickness of plain gauze. (3) Layer of rubber sponge  $\frac{1}{4}$  inch in thickness. The central portion of the rubber sponge was "saucerized" to prevent undue pressure on the elevated area. (4) Thin layer of dry gauze. (5) Elastic adhesive.



After complete removal of dressing illustrating the technic of suturing and "quilting" of the nipple grafts.

## EDITORIALS

### WHAT MAKES BABIES CLICK?

Now that investigators in the field of mental hygiene have focused attention on the early months of life as setting the stage for mental competency or aberration later on, it is becoming more and more important to look into the adjustments of life that a child must make in the early months or even the early weeks.

While it has long been known that a newly-born infant is an automatic individual, acting on a reflex, subcortical level, most physicians have not taken this fact seriously enough to accept its implications in the prescribing of treatment. The analogy between the behavior characteristics of a young infant and a new automobile is closer than one would imagine at first glance. Just as in driving a car we give little thought to the intricate engine purring under its hood, so also do we take for granted and pay little attention to a normal baby's respiratory, cardiac, and autonomic reflexes as they work along so smoothly under the surface. In many important respects the baby clicks entirely on his own.

But just as we realize that the driver has to supply a motor car with the proper oil and fuel and must steer it over the roads, so in many functions of life it is necessary that the baby receive outside help. This is particularly true in his feeding and in his social adjustment to his environment. No matter how efficient he is, no baby can secure his food without assistance

and nothing has been built into his makeup to teach him how to react to modern, complicated customs of life. Success in these fields is dependent upon the accomplishment of a co-operative job between mother and baby.

But a baby is not entirely impotent in regard to his feeding. He is equipped with a complicated set of reflexes designed to secure his food if he has a helpful mother. These reflexes are the hunger-appetite-satiety mechanisms, rooting, sucking, swallowing reflexes, and his cry.

The actual neuromuscular reflexes, rooting, sucking and swallowing, are present in all normal, mature babies, but their absence in young prematures makes more artificial methods, such as dropper and gavage feedings, necessary procedures.

Hunger causes pain in the stomach when food is needed and stimulates the hunger cry. Appetite is a psychologic attribute which keeps him feeding until satiety stops the process. These mechanisms are highly automatic and accurate, as any mother knows. Feeding a baby who is under the stimulus of hunger is easy, whereas getting milk into one who is not hungry or whose satiety mechanism has said "No" is almost impossible.

Because the function of feeding requires a co-operative mother, it is essential that she be instructed in how to help. No one would try out a new car without learning how to oil and fuel it. The physician who is familiar with the status of young infants and of their growth potentialities will see to it that a mother learns

to adjust her efforts to those of the baby so that she (1) offers food when his hunger appetite stimulus is active, (2) stops the feeding when satiety shows the red light, and (3) surrounds the feeding situation with as natural a setting as possible, by either nursing him at the breast or holding him close to her during the feeding time. This might be called, from the infant's viewpoint, a "self-regulating regimen." It avoids the inconsistencies of rigid schedules of time and amount of feedings which often lead to undue crying and anorexia. It makes babies click nutritionally.

In directing a child's responses to the many demands of our complex civilization, parents find difficulties in steering the course of the child's progress easily. Here again it is necessary to know the devious but well-marked path of growth and development. The key to success lies in making each new turn at the proper time, when the infant is mature enough to understand it. If we could learn to expect our youngsters to "act their age," many blocks to progress could be avoided. In climbing the rugged road of success in human relationships, we need to adhere closely to its twisting, well-worn path. It will "stall the engine" to go barging off on unfamiliar footpaths up the slopes.

Babies click best when we respect the way they were meant to work, when we "gas up" at the proper times with the right fuel and stick to the well-defined course of normal growth and development.

C. A. A.

## CANCER CYTOLOGY

A CONSIDERABLE body of evidence is accumulating which confirms the claim advanced thirty years ago by Papanicolaou, that early cancer can be diagnosed by cytological examination of various body secretions.

In a recent symposium conducted by McDonald and his associates of the Mayo Clinic, this technic was discussed, with particular ref-

erence to carcinoma of the lung, urinary tract, and kidney. These investigators found that all the features characteristic of malignant cells, which are seen in sections of tissues, with the exception of invasiveness, could be observed in isolated groups of cells, obtained in a smear.

Sputum or bronchial secretion from 70 patients yielded positive results. In 7 patients the lesions were found in the upper lobe, and were beyond the reach of the bronchoscopist; a specimen for biopsy could not be obtained. Diagnosis, therefore, was established only on the basis of the microscopic examination of sputum or bronchial secretions.

In another 7 patients the bronchoscopic examination was inconclusive or negative. Again, positive diagnosis was established on the basis of smears. Fourteen patients were in such physical condition that bronchoscopy was contraindicated; for this group examination of sputum was simple, quick, inexpensive, and harmless. In 41 cases both the biopsy and smear yielded positive results. There was one false positive; the investigators have pointed out that false positive results occur in about 1 to 3 per cent of examinations, depending in part at least upon the microscopist's experience.

Malignant lesions of the urinary tract were diagnosed by examining microscopically the centrifuged and stained urinary sediment.

The investigators do not suggest that the technic will supplant existing methods of diagnosis, but that it will be a practical and useful adjunct. One of its major uses will be that of "screening" cases of unexplained gross and microscopic hematuria, questionable renal masses, or questionable lesions of the renal pelves or calices as seen in excretory urography. Or, carcinoma of the prostate gland or of the bladder may possibly be diagnosed by this procedure, long before the lesions are observable by current methods.

In applying the Papanicolaou methods to the diagnosis of cancer, an essential prerequisite is that the examiner know cancer cytology. When the pathologist is not only a histologist but also a cytologist, a big step will have been taken in eradicating cancer.

# This Month in Medicine

## PSYCHOTIC REACTIONS TO QUINACRINE INGESTION

SEVERAL authors have reported the occurrence of psychic disturbances following the ingestion of quinacrine (atabrine). The cause of these mental disturbances, however, could not be determined, for the persons taking the drug also had malaria.

Recently, Hoobler has reported severe toxic mental reactions in normal subjects, who had no malaria, and who took the drug for experimental purposes only. Thirty-one medical, dental, and medical administrative officers of a United States Army General Hospital volunteered to take quinacrine in suppressive and then in therapeutic doses.

Large doses of the drug—that is, therapeutic doses—produced mental disturbances in 24 of the 31 officers. The symptoms varied from mild insomnia and depression to severe psychotic reactions, with delusions, hallucinations, and profound changes in mood.

Hoobler suggests that the administration of 0.1 gm. of quinacrine daily for one week, 0.2 gm. daily for one week, and 1.2 and 0.9 gm. on subsequent days approaches the threshold of cerebral toxicity for this drug.

### SUGGESTED READING

HOOBLER, S. W.: Psychotic reactions to the ingestion of large doses of quinacrine in normal subjects. *Am. J. Trop. Med.* 27: 477 (July) 1947.

## CHEESE AND DISEASE

CONTAMINATED cheese has caused at least 59 epidemics, 2,904 cases of disease, and 117 deaths in the United States and Canada, since 1883.

Organisms most commonly associated with cheese-borne infections include members of the *Salmonella*, *Staphylococcus*, *Brucella*, and *Clostridium* genera. All of these organisms die out quickly

at high temperatures. Pasteurization of milk and aging at high temperature, therefore, are the essential means of preventing cheese-borne infections. Indeed, study of the various epidemics has revealed that they have been caused by cheese made from raw milk, which was sold and eaten too soon after it was made.

Many cheese-makers declare that pasteurized milk makes poor cheese. However, critical investigations have revealed that this view is not true, that pasteurized milk makes better flavored and higher scoring cheddar cheese than can be obtained from raw milk. Further, it can be ripened in about half the time, because it can be held at higher temperatures than cheese made from raw milk.

### SUGGESTED READING

FABIAN, F. W.: Cheese and its relation to disease. *Am. J. Pub. Health.* 37: 987 (August) 1947.

## RH IN PATERNITY DISPUTES

LEGAL precedent was set recently for the use of the Rh factor in settling paternity disputes. The bloods of the three persons concerned in the dispute were found to be compatible, when tested by the usual blood-grouping procedure. The husband could not be excluded as the possible father, on the basis of these tests. The Rh tests, however, revealed that the husband could not be the father, which is what he had contended all along.

The judge accepted the evidence of the experts, and held that the husband was not the father of the child. The remarkable feature of this case is that the judge ruled as he did in spite of the fact that he had no legal precedent by which to be guided. Rather, he established precedent.

### SUGGESTED READING

CURRENT COMMENT: Rh blood tests in disputed paternity cases. *J.A.M.A.* 135: 162 (September 20), 1947.



## STREPTOMYCIN IN TUBERCULOSIS

**S**TREPTOMYCIN achieves one of its most dramatic effects in the treatment of draining tuberculous sinuses. Recently, Brock has reported the use of this antibiotic in the treatment of 12 patients, of whom 11 were negroes, presenting a total of 60 draining, tuberculous, cutaneous sinuses. Prior to streptomycin therapy, the sinuses had been draining for an average of two years.

The drug was given in daily doses of 1.8 gm., 0.3 gm. every four hours, intramuscularly. Six patients were so treated for ninety days; the remainder were treated for one hundred fifty days, with an interruption of three weeks after the first ninety days.

Ten of the patients had draining sinuses which originated in bone. Some of these sinuses, as well as others, closed within a week or ten days following institution of streptomycin therapy. Within three or four days the purulent material decreased in amount and contained less pus. Induration and tenderness disappeared within a month or so. Bone that had shown radiographic evidence of destruction, gave evidence of regeneration following the therapy.

After beginning streptomycin therapy, 15 per cent of the 60 sinuses closed within one to four weeks, 15 per cent closed within six to eight weeks, 50 per cent closed within ten and twelve weeks, and the remaining 20 per cent closed within thirteen to twenty weeks.

### SUGGESTED READING

BROCK, B. L.: Streptomycin in the treatment of draining tuberculous sinuses. *J.A.M.A.* 135: 147 (September 20), 1947.

## PENICILLIN IN PROSTATECTOMY

**P**ENICILLIN used prophylactically, lowers the mortality associated with prostatectomy. This mortality is often the result of infection. Bell, an English investigator, found that by administering 20,000 units of penicillin intramuscularly, every six hours, to all patients with indwelling urethral catheters, the death rate from prostatectomy could be significantly reduced. The penicillin was given

routinely, both preoperatively and postoperatively for as long as the catheter remained in place, or (postoperatively) until the temperature returned to normal. Results obtained by Bell in his series of 217 cases attest to the value of this technic.

In Bell's 217 cases of prostatic obstruction, including carcinoma, all treated prophylactically with penicillin, the mortality rate was 3.7 per cent. An earlier series of 508 cases, in the treatment of which no penicillin was employed, had a mortality of 14.1 per cent. Cases of simple prostatic enlargement treated with penicillin gave a mortality of 3.1 per cent; without penicillin, 11.3 per cent.

Before penicillin was available, nearly 37 per cent of all cases of prostatic obstruction were submitted to cystostomy, with a case mortality of 15 per cent. Now, using penicillin, less than 11 per cent require cystostomy, and the mortality is zero.

### SUGGESTED READING

BELL, J. G. Y.: Penicillin as an aid in prostatectomy. *Lancet*, 2:347 (September 6), 1947.

## DELAY IN CANCER TREATMENT

**C**OMPARISON of recently accumulated data with those obtained ten years ago, reveals that today the physician is often the one most responsible for delay in diagnosis and treatment of cancer. Ten years ago delay was caused by the patient alone in 44 per cent of cases, by the physician alone in 17 per cent of cases.

During the past decade the public has become better educated to the necessity of getting to the physician quickly, when cancer is suspected. Hence, Leach and Robbins recently reported that today the patient alone is responsible for delay in only 32 per cent of cases, while the physician is responsible in 27.8 per cent of cases. In superficial cancer, such as skin, lip, and tongue cancer, the patient is most responsible for delay; but in cancer of the lung or stomach, the less obvious cases, the physician is the more culpable.

### SUGGESTED READING

LEACH, J. W., AND ROBBINS, G. F.: Delay in the diagnosis of cancer. *J.A.M.A.* 135:5 (September 6), 1947.

R. W. C.

# Consultation Service

This special consultation information service is offered as a regular monthly feature of *Postgraduate Medicine*. Readers are invited to call on this Service for answers to difficult medical problems from members of our Editorial Board best qualified to help. Each question will be answered by mail and those of general interest will be published each month. Address all communications to Consultation Service, *Postgraduate Medicine*, 512 Essex Building, Minneapolis 2, Minnesota.

## CHOLESTEROL METABOLISM

**QUESTION:** *Are there any diseases due primarily to disturbed cholesterol metabolism? What are the indications for ordering a blood cholesterol and/or cholesterol ester determination and what are the diseases which cause an elevation or depression of the blood levels?* M.D.—Ohio

**ANSWER:** There is insufficient information concerning cholesterol metabolism to permit one to state whether or not any disease is primarily due to this substance. The deposits that occur in xanthomatosis and Schüller-Christian's Disease are rich in cholesterol and its esters. Various people have suggested that a disturbance in cholesterol metabolism may be the cause of atherosclerosis.

The normal serum cholesterol value varies from 120-200 mg. per cent of which approximately 70 per cent is present as the ester. The concentration in the blood may be above normal in the following conditions: primary xanthomatosis, lipid nephrosis, hypothyroidism, diabetes mellitus, obstruction of the common bile duct, pregnancy, early or mild hepatitis, uremia and in some instances of atherosclerosis.

The blood cholesterol may be less than normal in acute yellow atrophy of the liver and hyperthyroidism. The ratio of cholesterol esters is considered of significance in relation to liver function. Marked loss of parenchymal function is accompanied by a decline in the percentage of cholesterol esters.

## VITAMIN K

**QUESTION:** *Should parenteral vitamin K be given routinely to every pregnant woman before labor and to every newborn? What is the proper dosage?* M.D.—Pennsylvania

**ANSWER:** There is no use in giving vitamin K routinely to pregnant women before labor because its effect is so transitory. Neither does there seem to be good reason for giving it to every newborn infant because such a small percentage of normal full-time babies show any hemophilic tendencies.

As a routine measure, the only valid occasion for administration of Vitamin K is to all women falling into labor prematurely. The reason for this is that premature infants are more likely than others to develop hemorrhagic tendencies, especially intracranial hemorrhage, and may thus be afforded some degree of protection.

## URETHRAL FEVER

**QUESTION:** *What is the present recommended treatment and cause of the so-called urethral fever or urinary fever which comes on after instrumentation of the urethra by passing a sound or catheterization?*

*In the event a patient has experienced one episode of chills and fever after the passage of a sound, should he be dilated again? Penicillin tablets, 100,000 units, were given after passage of the sound every three hours. The penicillin did not seem to have any effect on the chills.*

M.D.—Washington

**ANSWER:** The cause is thought to be the absorption of toxins and probably bacteria through venous sinuses in the urethra and periurethral tissues. These spaces are opened by dilatation and it is believed that when the patient next voids, the pressure of the urine forces the toxic material into the circulation. There is always some degree of edema after a tight urethra has been dilated. The best treatment is the placing of an inlying catheter

of small size, preferably No. 16 or 18 Fr. This is allowed to remain in the urethra and to drain the bladder for at least forty-eight hours, or until the temperature remains normal, for twenty-four hours. Penicillin is administered; sulfathiazole sometimes is administered coincidentally.

### USE OF POTASSIUM THIOCYANATE IN HYPERTENSION

*QUESTION: I have observed that four or five patients I have treated with potassium thiocyanate for hypertension have developed either tachycardia or frequent extrasystoles, with good results in lowering their blood pressure. I have not used excessive dosage but have tried to maintain their blood level between 8 and 12 mg. per 100 cc. Could you tell me if other doctors have observed this effect of thiocyanate or whether it is any contraindication to its usage?*

*M.D.—Ohio*

*ANSWER:* Considerable experience with the use of potassium thiocyanate in essential hypertension has failed to indicate that either extrasystole or tachycardia is a common complication. Unless either of these is marked, it would seem to be no contraindication to the continued use of potassium thiocyanate, inasmuch as there has been favorable reduction of blood pressure.

### TREATMENT OF LUES

*QUESTION: A white male, 31 years of age, has been under treatment for lues for approximately one year.*

*When first seen this patient already had secondary lesions, and his serology was strongly positive. He was given a course of penicillin in beeswax*

*and oil consisting of one daily injection for twenty days. However, this afforded no demonstrable benefit. He was then given semi-intensive therapy consisting of 40 injections of Mapharsen (0.06 gm.) and 16 injections of bismuth subsalicylate (0.2 gm.) in twenty-six weeks. At the end of this course, the patient had a negative Kolmer and a strongly positive Mazzini. (Quantitative Mazzini was 41000-0). One month later the Kolmer was moderately positive and at the present time both Kolmer and Mazzini are strongly positive (Quantitative Mazzini is 444 32-0). There are no luetic lesions or clinical signs evident at this time.*

*What further therapy is now recommended?*

*M.D.—Pennsylvania*

*ANSWER:* Results from the use of penicillin in beeswax and oil for patients with early syphilis have not been so satisfactory as those from the intramuscular use of penicillin given at three-hour intervals for a total of approximately 4,000,000 units. The successful results from the beeswax-oil combination are approximating 65 per cent.

Before further treatment for the patient described is outlined, it would be advisable to examine the patient's cerebrospinal fluid, because it might well be that the relapse of results of serologic tests of the blood are due to the fact that the patient has a positive cerebrospinal fluid. If the fluid is normal, it would seem advisable to give the patient a third course, consisting of penicillin administered at the rate of 50,000 units every two hours for a total of 80 injections, which course, if need be, can be repeated in two or three months. On the other hand, if the cerebrospinal fluid is found to be positive, it would be necessary to know the degree of positivity of the fluid before it could be determined whether or not the patient is a candidate for fever therapy.

# Book of the Month— A Report

## SURGERY OF THE AMBULATORY PATIENT\*

**D**RAWING upon his experience at the University of Pennsylvania Hospital outpatient department, Dr. L. Kraeer Ferguson presents a very comprehensive and informative compilation of ambulatory surgery. The value of this book is evidenced by the fact that it is the second edition of a rather recent publication. The author includes in this edition the new therapy of penicillin and sulfa drugs in surgical lesions.

There are many advantages to ambulatory surgery: it is advantageous to the hospital because it reserves the beds for patients actually needing bed and nursing care; according to Ferguson, fewer complications develop after operations on ambulatory patients than after similar operations performed on hospitalized patients. For example, in a large number of anal operations on ambulatory patients, retention of urine has never been encountered as a complication although this is well known as a frequent and troublesome complaint of the hospitalized patient. It must be understood, however, that the selection of patients is of major importance. When diagnosis is doubtful or when extent of the lesion is not definitely known, the operation should not be performed on the ambulatory patient at all.

The preparation for, and the conduct of, operations on ambulatory patients and postoperative care are discussed in two separate chapters. The chapter on dressings and bandages is unique because of Dr. Ferguson's ingenious application of simplified dressings and use of adhesive. Methods for applying non-cumbersome dressings that will hold over a long period of time are excellently illustrated in pen and ink drawings. The young practitioner will greatly appreciate the extremity dressings that are

shown because of their simplicity of application, and precision and neatness of appearance.

Local anesthesia is preferred by the author, with procaine hydrochloride being judged the most efficient local anesthetic agent which has survived the test of extensive clinical trial. It has been the anesthetic agent of choice in 87 per cent of the operations in Ferguson's surgical outpatient clinic. A drug which he has found successful for local

anesthesia in the opening of superficial abscesses is pure phenol. Excellent illustrations for the technics of local anesthesia are shown.

Treatment of inflammation due to infection is discussed with a physiopathologic approach. A review of the mechanism of inflammation introduces the chapter. The local application of external heat, elevation of the area of inflammation, physiologic rest through immobilization,

and incision and drainage when suppuration is present are the fundamental principles for treatment of infection. Some physicians may place more emphasis on one of the foregoing tenets than the others, but, in general, if the procedures outlined are followed success is assured.

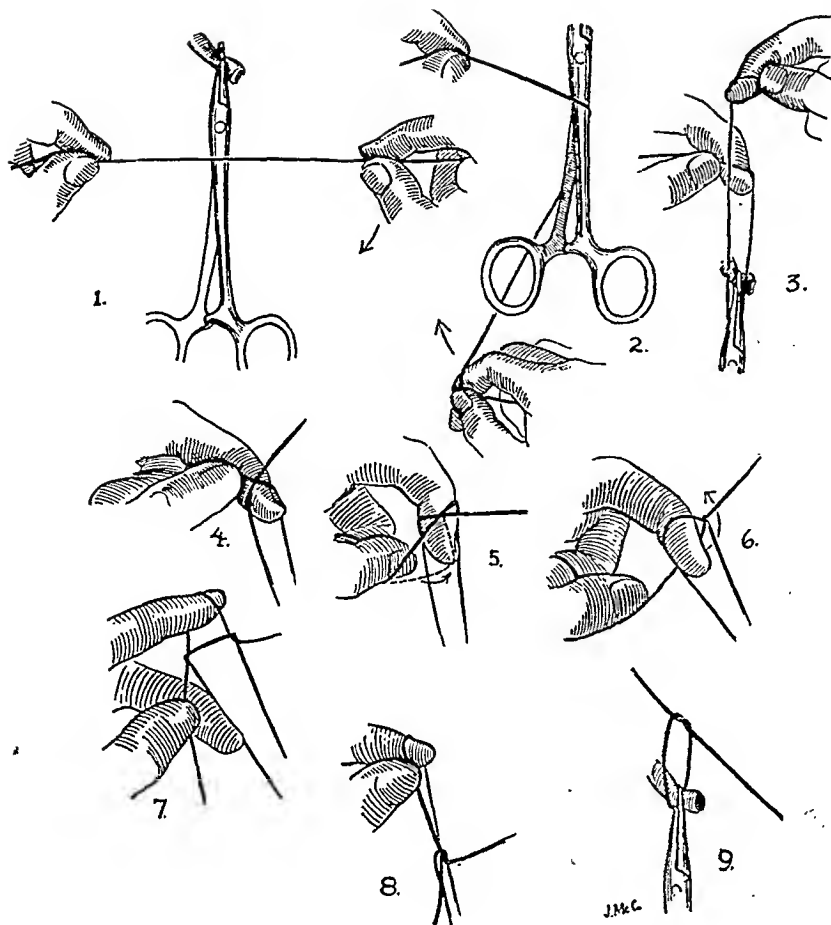
The mode of use and therapeutic action of the sulfonamides is included in the section on chemotherapy in the treatment of infection. Dr. Ferguson correctly emphasizes the great caution needed in the administration of sulfonamides to the ambulatory patient.

The use of penicillin in peanut oil and beeswax mixtures, both orally and locally, is advocated for the ambulatory patient because the intravenous and round-the-clock intramuscular injections of penicillin are avoided. A newer antibiotic, tyrothricin, is suggested as a topical application for the treatment of wounds and ulcers that are infected with pyogenic cocci.

There are separate sections devoted to the etiology, symptomatology, and treatment of lymphangi-



\*Surgery of the Ambulatory Patient, By L. Kraeer Ferguson, M. D., with a Section on Fractures by Louis Kaplan, M. D. 901 pages, 645 illustrations, 2nd Edition. J. B. Lippincott Company, Philadelphia, 1947. Price \$10.00.

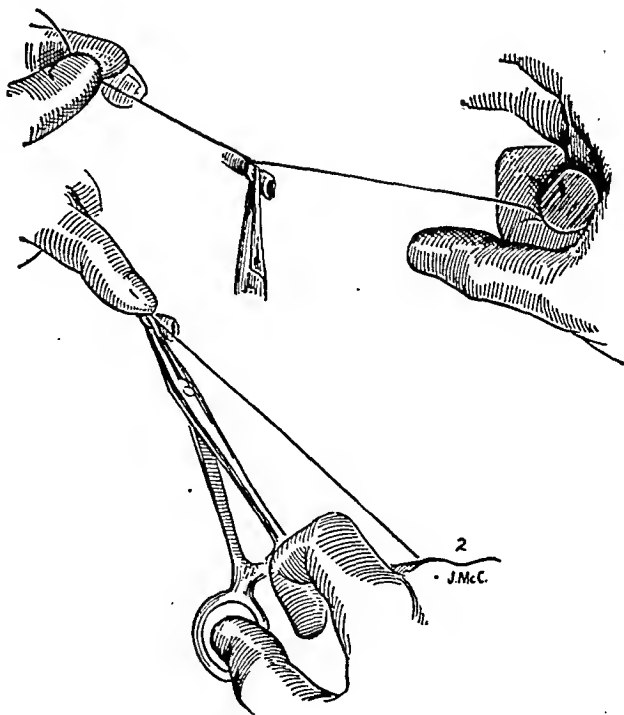


### METHOD OF LIGATING VESSELS WITHOUT ASSISTANCE

The ligature is held in the right palm. The free end of the ligature is grasped between the left thumb and index finger. The ligature is carried underneath the hemostat with the right hand and a finger tie is then made with the left thumb and index finger and pulled tight.

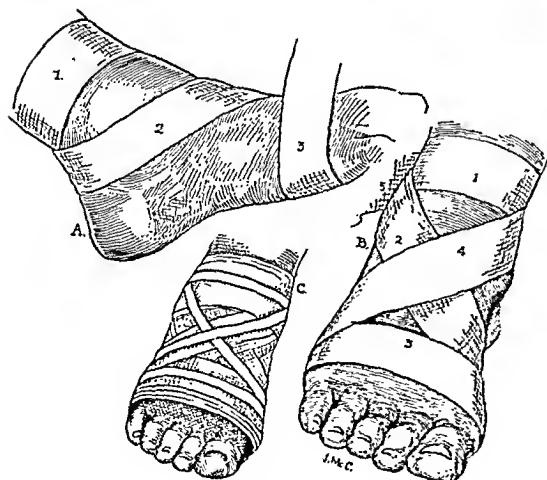
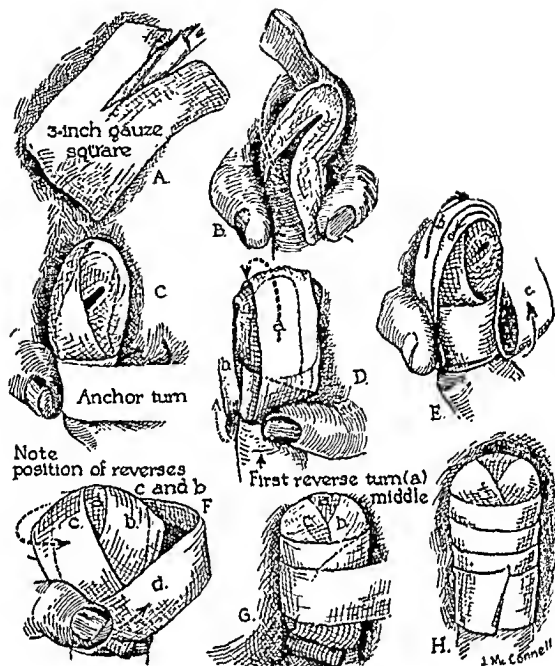
Maintaining the tension on the ligature spool in the right palm, and with the left forefinger holding the tie snugly in place, the hemostat is freed with the right thumb and index finger. A second tie is then made in the same manner.

*Illustrations from Ferguson: Surgery of the Ambulatory Patient.*



## DRESSING FOR THE FINGER

For dressings of the finger tip following an incision and drainage of an infection of the distal closed space, the 3-in. sterile gauze compress is cut as shown. The loose ends are then folded over the finger tip and the dressing is completed with circular turns about the gauze and recurrent turns over the tip of the finger.



## METHOD OF APPLYING A DRESSING TO THE FOOT

Bandages to the ankle and foot are most conveniently applied in figure-of eight turns around the foot and ankle. Two-inch bandage is usually used, with fixation by half-inch adhesive.

tis, cellulitis, erysipelas, erysipeloid of Rosenbach, acute lymphadenitis, dermatitis repens, meleney ulcer, tetanus, anthrax, human, animal, snake, and insect bites.

A comprehensive discussion of the treatment of burns and frost bites is included, and many useful surgical technics are described in a chapter on foreign bodies, superficial cysts, and tumors.

Part Two of the book, devoted to Regional Surgery, consists of thirteen chapters on the more specific lesions of the various parts. It begins with lesions of the scalp and progresses anatomically downward to the toes. One must admire the courage of the author in performing the type of operations he has done on ambulatory patients. With as much experience as Dr. Ferguson has, it is probable that they can be done, but for the novice, such things as elevation of a depressed fracture of the zygoma preferably would be done in a hospital. It must be understood that there is a difference between an out-patient who is ambulatory and a hospital patient who is ambulatory. Therefore, it may be that some of the advised procedures are done on patients who are in a hospital but are still ambulatory.

The information given in the section devoted to the peri-anal region, anus, and anal canal will more than suffice for the average physician's needs for knowledge and practical technics for lesions in those areas. Dr. Ferguson has justifiably exercised great care in writing this chapter because lesions

of this area when not treated correctly for itching and pain can result in great distress. The illustrations are more than adequate even for the physician inexperienced in proctology.

The genitourinary tract chapter includes some of the more recent treatments found successful in the Army. The ambulatory treatment of gonorrhea in the male with penicillin is given and Dr. Ferguson suggests that in cases when penicillin is ineffective, a combination of both penicillin and a sulfamide has been found successful.

The third and final section of the book was written by Dr. Louis Kaplan and is devoted to fractures. It is introduced by general considerations of etiology, pathology, diagnosis, and principles of fracture treatment. The author then discusses most of the fractures commonly handled in general surgical practice. The discussion is well organized and extensive and should prove useful even to an orthopedic surgeon. The illustrations and roentgenograms are typical and are good reproductions.

The book should be of great value to the medical student, recent graduate and general practitioner. It is encyclopedic in its content and all references are listed in bibliographies at the end of each chapter. One must understand, however, that the simplicity of presentation of technical procedures may belie their practical value, for a thorough knowledge of surgical principles and keen surgical judgment is still a must for a physician using the book for reference.

## RECEIVED THIS MONTH

**OCULAR THERAPEUTICS**, by William J. Harrison, M.D., Associate Professor of Ophthalmology, Jefferson Medical College; Chief of Ophthalmological Clinic, Jefferson Hospital; Attending Surgeon, Wills Hospital, Philadelphia. This pocket manual deals with the various drugs whose ocular therapeutic values have been determined by extensive clinical use. Charles C Thomas, Publisher, Springfield, Ill., 1947. Price \$3.50.

**TRICHOMONAS VAGINALS AND TRICHOMONIASIS**, by Ray E. Trussell, M.D., Associate in Hygiene and Preventive Medicine, State University of Iowa. With an introduction by E. D. Plass, M.D., Professor of Obstetrics and Gynecology, State University of Iowa. A bibliography of 1586 references is included, along with 19 figures and 16 tables. Charles C Thomas, Publisher, Springfield, Ill., 1947. Price \$6.00.

# MEN OF MEDICINE

## THE GENERAL ASSUMES COMMAND

IN THE handsome oak-panelled corner office on the seventh floor of the American Medical Association building in Chicago, sits a broad-shouldered, genial man who is the new Secretary and General Manager of the Association. He well becomes the office, and its duties present no hazards of flank attack or ambush for an old army man with thirty-three years of service with its Medical Corps to his credit. When he resigned from the Army in 1945, George Fairless Lull was Deputy Surgeon General with the rank of Major General. A.M.A. headquarters refer to him proudly as "The General" and more than one little typist as she watches the tall soldierly figure stride down the hall has been overheard sighing, "Wouldn't it be wonderful if he still wore his uniform!"

He first donned the army uniform in 1912, apparently motivated by youthful bravado and sheer stubbornness, but the gratifying regularity of his advancement in rank demonstrated that his decision was soundly based on innate aptitudes. The ingeniously administered advice of a wise teacher was important too.

George Lull, born in Scranton, Pennsylvania, received his M.D. degree at Jefferson Medical College in 1939, then interned at Jefferson Hospital. In 1911, bearing the lugubrious title of Demonstrator in Morbid Anatomy, he handled autopsies for Philadelphia General Hospital and was assistant to Dr. W. M. L. Copeland, an excellent pathologist, a hard taskmaster, and—as appeared later—a psychologist of unusual discernment.

"How I happened to enlist was really odd," Dr. Lull's smile deepened as he reflected on the irony of that choice. "There were several of us youngsters working at Jefferson, and one week end with permission to go to Baltimore, three of us ended up visiting with some of the army boys in Washington. I was interested in the experiments they were doing with inoculation for typhoid and ty-

phus. When we got back, the first thing I knew Copeland yanked me in and announced that if I was fooling around with some notion of going into the army, I might as well understand at once that he had no intention of renewing my contract! I needn't think I could flunk the exams and then flop back onto Jefferson. Well, I was flabbergasted. I'd had not the slightest intention of trying out for the army until he made that speech. But it got me sore and I decided I'd show Copeland I could get into the army if I wanted to. I knew it would be tough—only 5 per cent of the applicants were being accepted—but I took the exams that fall along with fourteen others. Only three of us made the grade and went on to the Army Medical College in Washington. Copeland was rather stiff and formal when I said good-by. Never saw him again till 1919 when I ran into him in Germany and we had dinner together. He told me then he'd known from the beginning that I'd make a good army man, but I was so darned bull-headed he knew it was no use suggesting it as a career. So he played it the other way, got me so mad that I went in to prove to him I could."

Dr. Copeland, at long last, was thus proved as a vocational diagnostician as well as pathologist. He had recognized Lull's interest in clinical pathology and his indifference to making money. And most certainly the army proved to be the right place for young Lull. It provided him with varied opportunities and enabled him to develop surprisingly diverse talents.

On his first tour of duty outside of the United States Dr. Lull served as medical officer for the 29th infantry in the deserted ghost town of Culchra in the Panama Canal Zone. One battalion was sent to act as lock guard at a new post; Gatun. There he learned how a native of a malaria-infested country acknowledges his daily two tablets



of quinine prescribed by the army: He turns his tin cup upside down to prove that he's drunk the water; he says clearly "Thank you," not to conform to etiquette but to demonstrate he's not concealing the tablets under his tongue!

Before his tour of duty in Panama was completed, Dr. Lull was brought back to McAllen, Texas to build a camp hospital for the National Guard then stationed on the Mexican border. Squadron A was made up of light-hearted New York youngsters who'd joined up to ride the horses provided at the National Guard Armory and to have fun generally. Dr. Lull remembers them affectionately when he says:

"I needed to staff a laboratory at the hospital and when I interviewed the three men they sent over I found they were all young doctors. Best staffed laboratory I ever saw. Every man in the squadron became an officer and later they were all in France. Made fine records, too."

There were more training camps to lay out and camp hospitals to build before Dr. Lull managed his own transfer to France. One of the largest was the two thousand bed hospital at Camp Beauregard, Louisiana. "And do you know what most of the patients in those beds were suffering from? Measles and mumps! The boys were recruited chiefly from country districts in Louisiana and Mississippi. They'd never been exposed to such diseases enough to build up any immunity, and childhood plagues ran through that place like wildfire."

George Lull, chafing at orders that kept him in Louisiana when he wanted to be in France, patiently filled in the War Department questionnaires inquiring what available officer could accept full charge of the hospital. With monotonous regularity, he wrote down the name of Major John T. Burrus. At last came a telegram from the War Department reiterating the question already asked innumerable times. Dr. Lull wired Major Burrus' name to Washington. A cautious telegraphed inquiry from the War Department was his reply: "Will you, George F. Lull, assume full responsibility for all Major Burrus' actions in your absence."

Recklessly, Dr. Lull sent off an unconditional yes, proceeded to France and took over the command of base hospital Number 35, sponsored and com-

pletely staffed by the Good Samaritan Hospital of Los Angeles. For faithfulness and distinction in discharge of his duties, he was awarded the Certificate of Meritorious Service by General Pershing, a decoration reserved for a very few outstanding individuals. Years later all the men who had been recipients of so high an honor were also given the Purple Heart, so that accounts for another of the General's impressive row of ribbons.

**I**N WORLD WAR II, Dr. Lull, then in his late fifties, served the entire time, as he ruefully observes, in the Army of the Potomac with headquarters in a commandeered apartment house. He was in charge of personnel, a position for which his abilities and kindly human warmth made him particularly suitable. Speaking appreciatively of his fellow doctors, he says:

"The medical profession of the United States can take great pride in the fact that through a purely volunteer system its members offered their services in such large numbers. Many men who had to remain at home in essential positions were bitterly disappointed that they could not participate as members of the armed forces.

"It would not be just to close . . . without mentioning the doctors in the older age groups who volunteered in such large numbers. Many of them who were sixty years of age traveled long distances to Washington to plead that they be given a chance to enter the Army. They, as well as their fellows in the service, can be proud of their profession's war record."

When Major General Norman T. Kirk was appointed Surgeon General of the Army, George Lull was made a major general, and given the position of Deputy Surgeon General. Among his new duties was the supervision of the recording of innumerable statistical tables, a task that presented few difficulties to a man who had originated the course in Vital Statistics in the Army Medical College.

Dr. Lull also likes to recall his years of duty as medical adviser to the Governor-General of the Philippines. He served in that capacity under three different men: Theodore Roosevelt, Henry L. Stimson, and Dwight F. Davis. It was with Davis that



GEORGE F. LULL, M.D.

Dr. Lull was most closely associated and with whom he undertook a five hundred mile informal inspection trip of Mindanao. Dr. Lull refuses to dramatize the experience, stating flatly that their expedition was not through the country of the headhunters.

On this trek the two men were accompanied by Davis' young son, Pete, an Army captain, an aide, and an interpreter who understood the differences between such closely related dialects as Malano and Bagobol.

"That interpreter was a clever fellow," reminisces Dr. Lull. "He lived permanently in the Islands; incidentally, I heard not long ago that he was captured and tortured to death by the Japanese."

In those days, when the little party of five men

waded upstream, rode in dug-outs when they could, camped where they found themselves, or were occasionally lucky enough to find accommodations in one of the small schoolhouses that were a landmark of the American occupation, the natives were curious but generally friendly.

At a ceremonial council meeting, one chieftain diplomatically announced that he welcomed American rule for himself and his people, but he would have none of those despised Visayans who merely aped their betters. His tirade was directed against the Filipino Christians generally, although the term Visayan that he used with such contempt, applies properly to a large group who, with the better known Tagalogs, constitute the majority of civilized Filipinos. Another remote tribal leader,

less polished but more frank in his expression, made a long speech apparently of incredulity and amazement. The interpreter translated freely: "He says he's heard of God and of the Governor General, but he'd never expected to meet either of them in person!"

Dr. Lull points out that few people realize the great extent of the Philippines—actually the Islands extend from north to south a distance as great as that from Canada to the Mexican border. Moreover, eleven of the islands have an area of more than a thousand square miles apiece, and the terrain varies from malaria-infested swamps to inaccessible mountain peaks.

Being entrusted with the health of so widespread a population was a tremendous responsibility. The mixed racial origins and religious beliefs of the people complicated matters still further. One example is typical: The Mohammedans—of whom there are some 500,000 in the Islands—would not allow themselves to be touched by Christians. Since the Army medical officers and most of the trained native assistants were Christians (probably recruited from the able Visayans and Tagalogs of Luzon), this tabu meant that Mohammedan groups were constantly neglecting routine immunization and inoculation. Other factors were the reluctance of the fledgling Filipino legislature to appropriate sufficient funds for public health, and the occasional native carelessness in handling serum or neglecting to provide new seed stock. The American policy of keeping hands off and letting the Filipinos learn by experience made the task still more delicate.

In spite of setbacks and obstacles, a remarkably fine public health program was set up and maintained in the Philippine Islands, and Dr. Lull was one of the men who made possible the success of that program.

**A**FTER his return from France in 1919, Dr. Lull had been sent to organize the First Corps Area Laboratories at Fort Banks, Massachusetts. By then he had added to his original bent toward pathology, an active interest in sanitary engineering and preventive medicine. Taking advantage of being stationed near Boston he attended seminars at

Harvard. The school itself was set up under the auspices of Massachusetts Institute of Technology, Harvard Medical School, and the School of Sanitary Engineering of Harvard University.

Sedgewick of M.I.T., Professor Whipple and Dr. Rosenau of Harvard combined their efforts to make the courses unusually valuable. Upon completion of the work there, Dr. Lull received his certificate in Public Health. Several years later, on an eight months' leave of absence from the Army, he completed his academic training at the University of Pennsylvania, receiving the degree of Doctor of Public Health.

In 1929 he returned to the Army Medical School in Washington where, during the absence of Henry Nichols he acted as head of the Department of Preventive Medicine, remaining as assistant head for three years after Nichols' return. He was responsible for adding to the curriculum new courses in Vital Statistics and Sanitary Engineering.

Sympathetic insight and warm human understanding do not ordinarily distinguish Army administrators, yet exactly those traits characterize George Lull. Among his army colleagues and the men who worked under him he was dubbed, with trust and respect, a square-shooter. Operating in the miasma of professional jealousies and thicket of red tape that hedge Army procedure it's not easy to continue to deserve that forthright epithet.

The "General's" geniality is neither a mood nor a front, but goes all the way round and all the way down. A constantly functioning sense of humor is one of its components. Thus Dr. Lull can relate with amusement of the time the Army ordered him to proceed from Fort Sam Houston, Texas, to San Francisco en route to the Philippines via Nicaragua and New York aboard a transport vessel rather than pay railroad fare from Texas to California! The ship ran aground and put into the Canal Zone for over a month, but that delay, too, he not only took in his stride but utilized. A throw-back, he conjectures, to the calm and solid sense of a remote ancestress of his in Byfield, Massachusetts who, when she was only five, was captured by the Indians not many years after the first Lull had settled in Ipswich in 1670. The little girl was never seen again by her family nor by white people until she emerged from the forests some sixty years later,

tough, leathery, unregenerate, and utterly bored by the idea of resuming the effete and finicky ways of the English settlers!

In his steady rise in eminence Dr. Lull has avoided conflict and useless kicking against the pricks. During the war, in his position as director of personnel, he saw the unending friction between army regulations and the rebelliousness of individual practitioners. It is a tribute to his nature that while understanding the natural opposition, he himself has never found occasion to resent discipline nor has he ever had to accept arbitrary professional dictation from a line officer.

Possessed of such a notable degree of sympathetic understanding, Dr. Lull nevertheless chose the broader applications of medicine rather than the confines of laboratory research or the intimacy of doctor and patient. Yet in his early childhood it was a country doctor of the horse and buggy era that first excited his deep admiration, and kindled in his heart a desire to be like him. To young George, the child of prosperous but simple farming people, old Dr. Paine represented hope in time of trouble, relief from suffering, reprieve from the fear of death itself. All those emotions struggled inarticulately below the surface of the boy's consciousness as he watched the familiar figure on the roads of the community in all seasons, all extremes of weather. Once it was George's own brother who lay feverish and gasping in distress, though the scarlet fever which the family had recognized and treated should have long been over. It was dark and windy and very late at night when the faithful Dr. Paine arrived, but he brought with him a blessed sense of security and freedom from the fear that the child who had waited so anxiously never forgot.

Probably from that early admiration stemmed George's determination to become a doctor, for there were none in his immediate family background. There are now, however, for not only did George Lull become a doctor, but so did his brother, and his brother's son, and his own son. Thus he stands at the beginning of a dynasty, for his son has followed in his father's footsteps by enlisting in the Army Medical Corps and is stationed at Fort Sam Houston where his father once served. But time—and medical progress—accelerate

with dizzying speed. The son's specialty is not hospital engineering or sanitation but radiology.

As a spokesman for the A.M.A., Dr. Lull speaks out clearly his praise of the family doctor who understood the patient's background, disposition, circumstances as well as his ailment—when indeed practiced psychosomatic medicine without knowing it. As he is fond of putting it, "We must treat the patient rather than the disease." And he sees an ever-broadening field for the general practitioner even in these days of highly differentiated specialization. . . . "There is a great need for qualified general practitioners of medicine, in many more areas, relatively speaking, than there is for specialists. Many areas fully able to support a few general practitioners are unable to support specialists but, as more and more young men elect to take specialty training, fewer will be available to perform the duties of general practitioners. I have no solution for this problem, but I know it is of interest as it is closely related to the distribution of medical care and to the training of physicians."

To his present job as Secretary and General Manager of the A.M.A., Dr. Lull brings broad resources of medical knowledge and ability to deal with medical personnel. Nor is he a stranger to A.M.A. procedure. For three years he served as the Army delegate in the House of Delegates of the A.M.A. During the war in his position as Deputy Surgeon General, he was constantly in touch with the activities of the A.M.A. in classifying, contacting, recruiting, and assigning doctors to the military services and our home population.

Now the A.M.A. under the able leadership of its proved and war-tested general has resumed its peacetime activities. Some of its earlier campaigns have achieved such success that they are long since chalked up as milestones in medical history. For example, rigid and uniform requirements in medical training was an objective toward which the Association struggled for years. Dr. Lull speaks of the present situation: "It is only in the last fifty years that this big improvement in medical education has taken place. Now we have only one school operating in the United States that has not been approved fully by the A.M.A. There are one

or two others on probation, they haven't been fully approved, but the A.M.A. now is the referee, so to speak, of whether or not the student is receiving the proper type of medical education. All of us who have lived during the early years of this century realize that it has taken a great many years to establish this basis, and to set up standards that could be enforced in medical education. We now look with satisfaction upon the fact that we lead the world in medical education."

Similar uniform standards have been set up and enforced in regard to hospitals.

An interesting shift of emphasis has occurred in the department that once investigated and tried to get rid of patent medicines and quackery. Today its quarters and its personnel have, because the job was so well done, shrunk to comparative insignificance. On the contrary the drug houses and pharmaceutical firms, once wary and suspicious—sometimes even actively hostile—now clamor to have their products tested and blessed with the A.M.A. stamp of approval. As a consequence the physical and chemical testing laboratories have grown apace, spreading over a large part of one floor, and employing highly skilled experts in both fields.

As a matter of fact the whole eight floors of the dignified but modern building on North Dearborn abound with experts. Some retire to a quiet corner and read, translate, edit, and abstract material from the leading medical journals of France, Spain, Sweden, Russia and Czecho-Slovakia. Necessarily, linguists who are also doctors are at a premium. They get on nicely with their neighbors, the library staff. A special contingent provides reference material for physicians, sending out so-called "package libraries" to a man worried over a puzzling case that defies his diagnosis with a parade of contradictory symptoms, or assembling material for a hard-pressed doctor with a speech to the county society looming ahead of him. Like other of the branches requiring skilled and experienced workers, this service is badly understaffed, a condition that seriously cuts down its usefulness.

Finding competent, trained personnel has been another problem for Dr. Lull. Resourcefully he added to the skilled clerical staff by employing veterans part time while they're attending college

in Chicago. But sometimes he must wish he could merely requisition from the inexhaustible man power supply once available to the army, two Russian translators, six laboratory assistants, ten librarians, a motion picture operator, and a score each of experienced clerks and typists!

The movie projection man would come into his own in a diminutive specially built room where films illustrating new surgical technics or the crystallization process of a new drug can be run off at any moment. Many of these films also are available for county or state medical groups. And as Dr. Lull colloquially terms them, platters too are available for medical groups—thirteen series of them on as many different topics, sufficient to keep a medical society broadcasting once a week for four years. There are also graphs and charts and maps and posters, making vividly concrete such diverse problems as the incidence of typhus over the world, and the best places in the United States for a young doctor recently released from the army to hang out his sign.

Tucked away in another corner is the ethics department, which is acutely aware that such new technics of education as the film and the radio present their own confusing issues. Here again the trend has changed from suppressing and forbidding to persuading and urging ahead in legitimate channels. "Believe it or not, sometimes we practically have to beat our own colleagues over the head to make them see that telling about the new operation they've discovered over the air may be the finest thing in the world for the medical profession. If it's done under the auspices of the A.M.A., that is, and not as a private promotion scheme of some radio station or sponsor."

Dr. Lull is especially proud of the program "Doctors Then and Now" that ran for twenty-six weeks on N.B.C. and received the first award for public service programs from the Eleventh Institute for Radio in Education of Ohio State University. The N.B.C. show is only one of several, for programs were broadcast in 1947 on all four major networks.

A.M.A. encouragement of voluntary plans for health insurance is whole-hearted. Indeed the Association practices what it preaches to such a degree that there is no corridor or restroom without its warning notice urging employees to report any

injury at once. For general circulation it has published a reliable directory of plans containing detailed and comparable data on each, and has also devised a set of standards for use as a guide in issuing the seal of acceptance. And when the A.M.A. assembles data and files it, as they have done on their complete roster of physicians in the U.S.A., the F.B.I. had better look to its laurels! What isn't in the A.M.A. cards not even the doctor's best friend could tell you. Just in passing it might be well to warn John L. Lewis that the Council on Medical Service has undertaken a special study and follow-up of the United Mine Workers' Health fund!

The Council on Industrial Health gives another instance of how the A.M.A., instead of limiting itself to discussions of clinical medicine and surgery, has extended broadly into the related fields of medical economics, public relations (there's a whole department) and social legislation. The Council studies such specific matters as rehabilitation and employment of the handicapped, air conditioning and ventilation, noise control, women in industry, mental and personal hygiene of the worker. The list might easily be made even more imposing, but Dr. Lull feels that in that particular field the most notable gain has been professional acceptance. As he sums it up: "More and more physicians are realizing that to industrial health there are great possibilities for professional advancement as administrators, consulting specialists, clinicians, and investigators."

But despite the multiplicity of bureaus, councils, and committees the general manager can spare a thought for the problems of the seven hundred or more workers currently employed by the A.M.A. Under his regime there has been set up the Bureau of Industrial and Personnel Relations. Not only has every job at Association headquarters been carefully evaluated, but a sincere attempt is being made to keep everybody happy by promoting and transferring individuals from one department to another when a vacancy occurs rather than to have each office act as a separate unit.

**E**VEN so hit or miss a sampling of the various activities constantly advancing under the aegis of the A.M.A. and the watchful eye of Dr. Lull

gives some idea of their diversity and scope. A light rein and an easy hand characterize Dr. Lull's method of helping everyone to pull together and to pull ahead.

"Routine matters slide along easily enough, and even some not so routine," smiles Dr. Lull. "And I like my job of liaison between our members and the Association, telling them what the Association has to offer them. Not a bad idea to let them know how they can help the Association either. Nothing I'd like better than lots of letters with questions, suggestions, yes, even gripes, from the doctors." His hazel eyes regarded the glass-topped desk speculatively, and suddenly the quiet smile deepened into a chuckle. "Not that I ever want to be confused with a contest judge or a music publisher again! You know I was once. Speech I made during the war, and I happened to mention that it was too bad no good marches had turned up in this war. There were plenty of 'em last time, but nothing now except a couple of sentimental ballads like 'The White Cliffs of Dover' or 'Lilli Marlene'—and that wasn't even ours. We didn't turn up a 'Pack Up Your Troubles in Your Old Kit Bag' or even a 'K, K, Katy.' Anyhow that remark I just happened to make was the only thing the A.P. men quoted in the papers, and in less than a week my desk was literally buried in marching songs sent in from everywhere! Some of 'em had just the music and wanted me to write the words, some of 'em sent in words they wanted me to refer to Irving Berlin for a tune! It got to be the joke of the department. Songs, music, lyrics—hundreds, thousands of 'em. Must have thought I was Sousa!"

"Oh, I appreciate mail, lots of it; but no more music clearing houses."

Rather a predicament for a busy Deputy Surgeon General, but perhaps he might contribute to the A.M.A. in addition to his more conventional duties, a really rousing good song, something reminiscent of marching men in far-flung lands, men defying, attacking, conquering the worst enemies of all, ignorance and pain and disease. Dr. Lull is an old campaigner in that unceasing battle and his encouraging voice is one that his fellow soldiers like very much to hear.

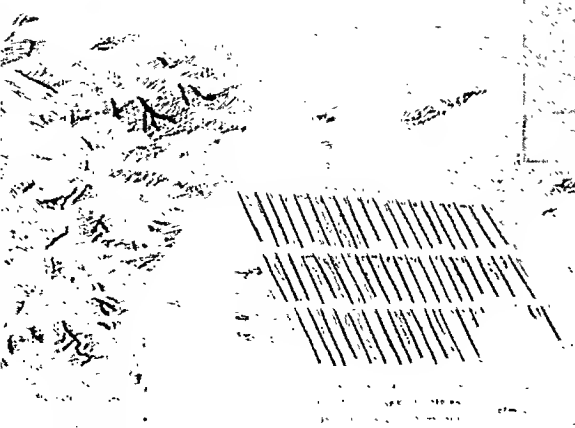
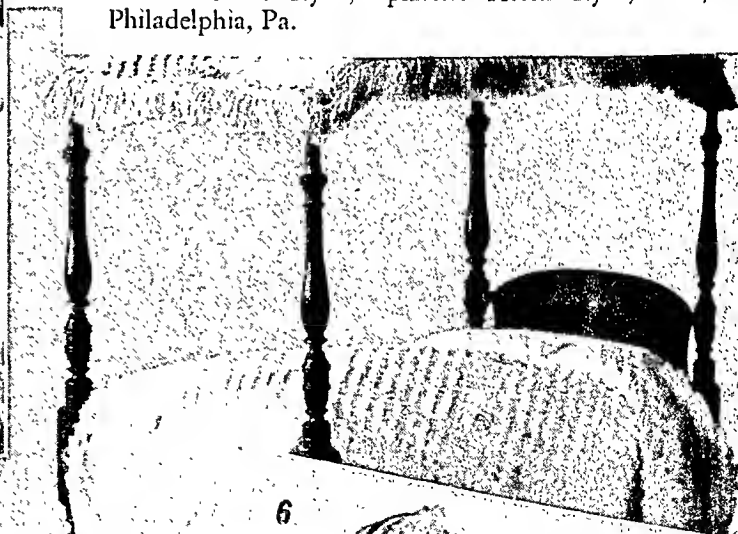
L. C. DEINARD



## 1947 Prize Winners in American Physicians Art Association

*Exhibited at the Centennial Session of the American Medical Association, Atlantic City, June 9-13.*

1. "The Cow Barn," pen and ink. Solomon Fineman, M.D., New York, N. Y.
2. "Lusk's Point, New Zealand," Kodachrome. L. Allan Erskine, M.D., Palmerton, Pa.
3. "Portrait, Dr. H. S. Appell," oil. J. Louis Jack, M.D., New Haven, Conn.
4. "Miniature Bed," woodwork. David Rose, M.D., Belmont, Mass.
5. "Spring House," linoleum block. A. R. Pittman, M.D., Trenton, N. J.
6. "William Ryan," plaster. Helen Ryan, M.D., Philadelphia, Pa.





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7. "Portrait of Mother," oil. John F. Smith, M.D., Los Angeles, Calif.

8. "Interior (of an interior)," drawing. Beatrice Raymond, M.D., Chicago, Ill.

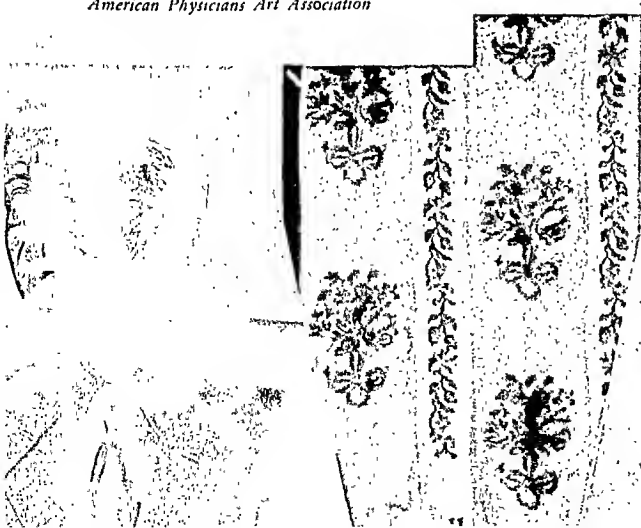
9. "Battle Winner," bronze. Edward G. Deming, M.D., West Hartford, Conn.

10. "Franklin D. Roosevelt," sculpture. Harry Weiner, M.D., Brooklyn, N. Y.

11. "Rose Bouquet Afghan," needlework. Clare N. Reese, M.D., Oraville, Calif.

12. "Autumn Flowers," watercolor. A. C. Isham, M.D., Pittsburgh, Pa.

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# What Other Editors Think

## Editorial Evaluation of Current Contributions To Medical Progress

### MEDICAL GENETICS

THE recent observance of the 100th anniversary of the New York Academy of Medicine highlighted anew a problem which has been too long neglected, but which is growing rapidly in importance and cannot be stressed too strongly. The need for a thorough training of medical students in the principles and practical applications of medical genetics is becoming more apparent with each new discovery in the field.

At this gathering Dr. H. J. Muller, who received the Nobel Prize in Medicine for 1946, discussed the question of the accumulation of mutations in human populations, both from natural causes and from artificial radiation, including x-rays and the emanations from nuclear fission such as those used in the atomic bomb. He presented valuable suggestions for "mutational prophylaxis."

Dr. Laurence H. Snyder of the Ohio State University, in 1940, in the Biggs Lecture on Medical Genetics and Public Health, then discussed the training of physicians in this field. He pointed out that the adequate understanding of Dr. Muller's important presentation, which has a bearing on the lives of all of us, is dependent upon a knowledge of the basic principles of heredity. Furthermore, the physician needs not only a basic acquaintance with genetics, but a specialized knowledge of medical genetics, because of the very practical benefits which this knowledge may bring to the practice of medicine.

Dr. Madge T. Macklin has for years stressed at every opportunity the need for medical genetics in the medical curriculum. At first only a voice crying out in the wilderness, she has been joined by a veritable chorus.

Medical schools are slowly but surely responding to this challenge. Fifteen years ago Macklin conducted a survey which revealed the fact that

not a single medical school at that time offered a course in medical genetics, and only two schools presented any material on the subject in other courses. Snyder has also presented the results of a similar survey just completed. Today three medical schools have required courses in medical genetics, four have elective courses, and ten more are planning to present such courses in the near future.

In addition, forty-two medical schools actively present material on medical genetics in connection with didactic or clinical courses.

This progress is highly commendable, but much remains to be done. Every premedical student should be required to take a course in the principles of genetics, and every medical student should have training in medical genetics and its practical applications. Only then will the remarkable strides in this medically important science be made functional and profitable. To those engaged in obstetric practice, these facts are of particular import.

*American Journal of Obstetrics and Gynecology*, George W. Kosmak, M.D., Editor, p. 351, August 1947.

### ACQUIRED RESISTANCE TO ANTIBIOTICS

IT HAS long been recognized that microorganisms may acquire a degree of resistance to a drug as a result of exposure to sublethal concentrations, although originally they were highly sensitive to the drug's action.

Many highly susceptible species of organisms, such as the pneumococcus, the streptococcus and the gonococcus, have been found capable of acquiring such resistance to the sulfonamides. This is also true of the antibiotics penicillin and particularly streptomycin.

It is an interesting and practically important fact

that acquired resistance to either the sulfonamides, penicillin, or streptomycin does not affect the original susceptibility of the strain to the other drugs. The precise mechanism or site of their action is evidently different.

There are two obvious ways in which a strain of organisms might become resistant. Exposure to a sublethal concentration of the drug might bring about an adaptation as the result of a gradual progressive change in the metabolic activities of the bacterial population as a whole. This exposure, however, might operate by killing or inhibiting the growth of the sensitive individuals and permit a few initially resistant organisms to outgrow and replace the others. The former hypothesis seems inherently improbable because of the great rapidity with which a strain may become resistant, even within twenty-four hours in the case of one *H. influenzae* strain. Recent investigations to determine this point have furnished strong direct evidence in favor of the latter alternative.

Alexander and Leidy have reported careful studies of 14 strains of Type b *Hemophilus influenzae* derived from human infections, with respect to their sensitiveness to streptomycin. All the strains initially were sensitive to streptomycin, growth being inhibited by from 1 to 13 units per cc. of medium when ordinary inocula containing from 1 million to 1700 million organisms were used. Ten patients recovered under treatment, but four did not respond to streptomycin. In three of these cases, subsequent cultures yielded strains which were resistant in this drug, growing well in media containing 1000 units per cc.

They searched for individual organisms which were resistant to streptomycin in 10 of the initial (sensitive) strains by inoculating large quantities (142 billion to 522 billion organisms) on media containing 1000 units of streptomycin per cc. In every case a small number of colonies of resistant organisms appeared, the incidence varying from about 1:1 billion to 1:14 billion organisms. There was no correlation between the relative number of resistant organisms found in the original cultures and the subsequent development of drug-resistance during treatment.

The relative number of colonies of resistant organisms seemed to depend principally upon the

size of the original bacterial population cultured. Patients with severe infections and relatively large numbers of organisms in their tissues would therefore be much more likely than those with milder infections to harbor a sufficient number of drug-resistant organisms to overgrow the others and produce a resistant strain.

Miller and Bonnhoff have reported similar studies of 18 strains of meningococci which were sensitive to streptomycin.

The source of the few initially resistant organisms in these cultures is a matter of interest. Alexander and Leidy have advanced evidence to show that they possess the characteristics of bacterial mutants. Thus, there is a marked variation in the number of resistant individuals in different cultures of the same strain, depending upon how early in the growth of the culture the first resistant mutants happened to appear.

The calculated rate of occurrence of resistant individuals is very low, about 1/20 billion per bacterium per bacterial generation, and it was relatively constant for the different strains. The trait was transmitted unchanged through many generations. Miller and Bonnhoff concur in regarding their variants as mutations.

Accepting the hypothesis that the resistant organisms are mutants, this observation may be in part explained by the fact that in well treated patients the multiplication of the sensitive organisms is promptly stopped and there is a smaller bacterial population from which resistant mutants might arise. There is reason to believe that the outcome depends in part upon the number of such resistant organisms present.

Another point of practical significance is the fact that organisms which become resistant to one antibiotic retain their original sensitiveness to others. This makes it rational to administer them in combination when it is feasible to do so. The few variants of *H. influenzae* which are resistant to streptomycin, e.g., retain their sensitiveness to sulfonamides, and there is a better chance of eliminating the infection completely if both drugs are administered.

*Annals of Internal Medicine*, Vol. 27, p. 317, August 1947.

# New Drugs

Information published in this department has been supplied by the manufacturers of the products described

## PROPYL THIOURACIL TABLETS LEDERLE

**PURPOSE AND INDICATIONS:** For the treatment of thyrotoxicosis (Graves disease) both for preoperative preparation of patients with hyperthyroidism for thyroidectomy, and for medical treatment alone.

**COMPOSITION:** Propyl Thiouracil Tablets Lederle contain 50 mg. of 6-n-propyl thiouracil per tablet.

**DOSAGE:** Initial daily dose of 75 to 300 mg. divided into three doses at eight-hour intervals. Severe and moderately severe cases in adults usually require daily doses of 150 mg. to 300 mg. initially. Less severe cases may respond to as little as 75 mg. daily. When the patient has responded to treatment the daily doses may be reduced to 50 mg. according to the individual response.

**CAUTIONS:** Few toxic side effects have been reported, but, like thiouracil, propyl thiouracil is a potent drug with potentialities for the same type of reactions. White blood cell counts, including differentials, and constant observation of patients are always essential. Dermatitis, drug fever, leukopenia, some degree of granulocytopenia, and gastrointestinal upsets have been reported in a few cases.

**HOW SUPPLIED:** In bottles of 100 and 1,000 tablets.

**PRICE:** 100 tablets \$2.65 list; 1,000 tablets \$22.50 list.

**PRODUCER:** Lederle Laboratories Division American Cyanamid Company, Pearl River, New York.

## PENICILLIN CALCIUM BUFFERED TABLETS—CUTTER

**PURPOSE:** Oral treatment of low grade infection.

**DESCRIPTION:** Each tablet contains 10,000 units of calcium penicillin buffered with 0.4 gm. of calcium carbonate. They may be stored at room temperature for twelve months without any significant loss of potency.

**INDICATIONS FOR USE:** They may be used prophylactically in rheumatic or congenital heart disease when tonsillectomy or tooth extraction is planned. In pneumococcal, streptococcal and staphylococcal infections, they are effective used following the acute phase, during which penicillin has been administered parenterally.

**HOW SUPPLIED:** Screw-top bottles of 12 tablets.

**PRODUCER:** Cutter Laboratories, Berkeley 1, Calif.

## CYTORA "ROCHE-ORGANON"

**PURPOSE:** A modern hematinic for hypochromic anemias.

**COMPOSITION:** Each Cytora tablet contains: Folic acid, 0.75 mg; exsiccated ferrous sulfate, 100 mg; liver concentrate (1.20), 150 mg; vitamin C, 25 mg; vitamin B<sub>1</sub>, 1 mg; vitamin B<sub>2</sub>, 1 mg; vitamin B<sub>6</sub>, 0.5 mg; niacinamide, 5 mg; calcium pantothenate, 1 mg; plus other factors naturally present in liver concentrate.

**DESCRIPTION:** Cytora supplies iron, folic acid, and other dietary factors utilized for erythropoiesis.

**INDICATIONS FOR USE:** Recommended for hypochromic anemias: Anemia of blood losses (surgery, peptic ulcers, bleeding hemorrhoids, carcinoma of the stomach or bowel, ulcerative colitis, tuberculosis, hookworm infestation, amebic dysentery and purpura), nutritional anemia, anemia of pregnancy and lactation, anemia in the aged, anemia of hypermenorrhea, anemia of childhood, postinfectious anemia, convalescence and general debility.

**DOSAGE:** Recommended dose two tablets three times a day with or immediately after meals; for maintenance therapy after the blood has been restored to normal, two tablets per day.

**HOW SUPPLIED:** In bottles of 100, 250, and 1,000 tablets.

**PRODUCER:** Roche-Organon, Inc., Nutley 10, N. J.

## TRI-SULFANYL

**PURPOSE:** For treatment in all conditions amenable to sulfathiazole, sulfadiazine, or sulfamerazine.

**COMPOSITION:** Three sulfonamides combined. Each teaspoonful syrup (5 cc.) or one tablet contains 7½ gr. of sulfa compound; sulfathiazole 0.162 gm. (2.5 gr.), sulfadiazine 0.162 gm., sulfamerazine 0.162 gm., all *microcrystalline*. In syrup only—sodium citrate 5.79 gr. in a pectinized, vanilla flavored sugar base. This combination reduces danger of renal damage to a minimum.

**DOSAGE:** Eight tablets or teaspoonfuls of syrup, then 2 tablets or teaspoonfuls of syrup every four hours.

**HOW SUPPLIED:** Syrup—4 oz., 8 oz., 16 oz.

Tablets—50, 100, 250, 500, 1000.

**PRODUCER:** Casimir Fund Laboratories, Inc. (affiliate of U. S. Vitamin Corporation), 250 East 43rd Street, New York 17, N. Y.

## FURACIN SOLUTION IN A LIQUID VEHICLE

**PURPOSE:** An antibacterial agent for use where the ointment form is inconvenient or contraindicated—chiefly on wet dressings.

**COMPOSITION:** Furacin Solution contains:

	Per Cent
Furacin (brand of nitrofurazone: 5-nitro-2-furaldehyde semicarbazone)	0.2
Polyethylene glycol of mon-iso-octyl phenyl ether (wetting agent)	0.3
Carbowax (brand of polyethylene)	65.0
Water	34.5

**DESCRIPTION:** Yellow liquid with a viscosity twice that of water, and slightly hypertonic; stable under all usual climatic conditions. Because Furacin is discolored by light, it is dispensed in amber bottles and should not be left in sunlight. It should not be placed in metal containers. Furacin Solution has the same wide antibacterial spectrum as has Furacin Soluble Dressing, affecting many gram-positive and gram-negative bacteria found in surface infections.

**INDICATIONS FOR USE:** Same as for Furacin Soluble Dressing; for infected surface wounds, or for the prevention of such infection; infections of second and third degree burns; carbuncles and abscesses after surgical intervention; infected varicose ulcers; infected superficial ulcers of diabetics; impetigo of infants and adults; treatment of skin-graft sites; osteomyelitis associated with compound fractures in conjunction with indicated surgical intervention; secondary infections following dermatophytoses.

**CAUTION:** Although no cases of sensitization to Furacin Solution have as yet occurred in preliminary studies, it is to be expected that such will occur, as with Furacin Soluble Dressing—in approximately 4 per cent of cases. Furacin is a powerful antibacterial agent; it is *not* a "healing agent." As soon as Furacin has cleared an infection, it is advisable to use some bland preparation until healing is complete. Long continued, daily applications of Furacin may increase susceptibility to sensitization.

**HOW SUPPLIED:** Now available to pharmacies and hospitals for prescriptions, in 4 oz. and one pint bottles, at \$1.75 and \$4.75 respectively.

**PRODUCER:** Eaton Laboratories, Inc., Norwich, N. Y.

## STREPTOMYCIN MERCK

**PURPOSE:** Streptomycin is an antibacterial agent of low toxicity, possessing selective therapeutic activity against a variety of pathogenic organisms.

**DESCRIPTION:** Streptomycin in dry form may be stored at room temperature, not exceeding 30° C. (86° F.), for periods up to one year without significant loss

of potency. It should be stored in its original unopened container to prevent contamination and deliquescence.

**INDICATIONS FOR USE:** For treatment of infections due to susceptible gram-negative organisms.

**DOSAGE AND METHOD OF ADMINISTRATION:** At present, the three most common methods of administering streptomycin are subcutaneously, intramuscularly, and intrathecally. Dosage requirements vary with the sensitivity of the pathogen to the drug, the severity and location of the infection, and the presence of bacteremia.

**CAUTIONS:** Streptomycin is not to be regarded as a substitute for adequate surgical drainage or for the use of other therapeutic agents whose value in a given disease has been established.

**HOW SUPPLIED:** As the hydrochloride in rubber-stoppered, aluminum-capped vials. Since the total weight of the powder in the vial exceeds the amount of streptomycin base stated on the label it is recommended that the entire content of the vial be dissolved in a known volume of a suitable solvent, such as sterile, pyrogen-free distilled water or physiologic saline solution, and that an aliquot of this solution containing the desired dose be used for administration or for the preparation of more dilute solutions. Only clear solutions, free from undissolved particles, should be used parenterally or intrathecally.

**PRODUCER:** Merck & Co., Inc., Rahway, N. J.]

## LIQUOID MER-DIAZINE

**PURPOSE:** Chemotherapeutic agent against infections: prophylactic in wound infections, compound fractures, burns, etc., to supplement local therapy.

**COMPOSITION:** A palatable homogenized suspension containing per fluid ounce:

Sulfamerazine 1.5 gm. Sulfadiazine 1.5 gm.

**INDICATIONS FOR USE:** Infections caused by hemolytic streptococcus, pneumococcus, staphylococcus, meningococcus, gonococcus, Friedlander's bacillus, gas bacillus, aerobacter aerogenes, and other non-specific organisms causing urinary tract infections.

**DOSAGE AND METHOD OF ADMINISTRATION:** Children (up to 120 lbs. in weight)—30 mg. total sulfonamides per pound of body weight in 24 hours, divided into 6 equal doses. Adults—Initial 3-4 gm. dose, followed by 1 gm. every 6-8 hours thereafter, until temperature has remained normal for 48 to 72 hours. In very severe infections, the dosage may be increased 50 per cent.

**CAUTIONS:** Constant observation for toxic reactions is essential.

**HOW SUPPLIED:** Bottles of 4 fluid ounces and one pint.  
**PRODUCER:** McNeil Laboratories, Inc., Philadelphia 32, Pa.

# After Hours

## POSTGRADUATE ACTIVITIES BEFORE AND AFTER KELLOGG

The conference of Graduate and Postgraduate Medical Education held in the Rackham Building, University of Michigan, early in the summer, was a great success.

Deans of medical schools and directors of the services at the Universities of New York, Duke, Minnesota, Columbia, Emory, George Washington, Colorado, Iowa, Michigan, Meharry, Washington, Cornell, Oregon, Illinois, Tufts, and Virginia were called together by *Benjamin Horning* of the W. K. Kellogg Foundation. These institutions were recipients of grants from the Foundation for the purpose of developing or strengthening their graduate and their postgraduate programs.

Moderators of the sessions were *Harold S. Diehl* (Minnesota), *A. C. Furstenberg* (Michigan), *Joseph C. Hinsey* (Cornell), *Currier McEwen* (New York University), *Howard H. Cummings* (Michigan), and *Samuel Proger* (Tufts). Each school reviewed its graduate and postgraduate activities before and after Kellogg.

Special discussion subjects were: (1) The Graduate Training and Continued Education of the General Practitioner, (2) The Teaching of the Basic Sciences at the Graduate Level, and (3) Regionalization of Medical Education.

The directors of the services learned that they had a great deal in common when they started discussing the merits and demerits of their programs, while the deans and others discussed the subject from the administrators' standpoint.

On the second evening we were royally entertained by the Michigan group. Following this there was a dinner at which *Salvador Zubiran*, Rector of the National University of Mexico, spoke. He gave us an insight into Mexican University life and his proposed expansion program. Unique indeed was the manner of arranging the buildings, and their purposes. There was to be a covered walk for students and a large stadium for athletics.

We also saw the Navy film on the Bikini party which was noisy and colorful. The possibilities of atomic warfare were explained by *Dean Sawyer* of the graduate school.

A splendid gesture was extended by the W. K. Kellogg Foundation in inviting *Lester J. Evans* of the Commonwealth Fund to take part in the discussion. There was a great deal of debate on the basic sciences. . . . *C. E. de la Chapelle* gave a dynamic description of New York University's fine plan. . . . *Wilbur C. Davison* who sounds like Orson Welles and looks like a character in a detective story (minus the peaked fore and aft hat), explained Duke's plans. Well known author of the *Compleat Pediatrician*, he is a stimulating person. He told me he wrote the book from the notes which he compiled as a student and later as a physician. He published his own book when he learned what the terms of the book publishers were to be.

He has a standing offer of a dime for every error found by students. As a result it has fewer

errors than many textbooks. A student who wishes to take his girl to the movies, reads the book until he has found the proper number of errors and then collects.

Columbia's Assistant Dean, *John B. Truslow*, gave a scholarly report of their program. . . . *Hugh Wood* of Emory won many to his side when he doubted that a recent graduate who has only had three years of training in internal medicine could act as a consultant. He also felt that the men who are now receiving advanced training in internal medicine were going to make the best type of general family physician in the future.

Scholarly, quiet, dignified *Walter A. Bloedorn* told of the extensive program George Washington is developing. . . . *Ward Darley* is leading Colorado into new areas of expansion by cooperating with all existing agencies in the state. He came out of practice to take over the deanship and is doing a spectacular job.

*C. F. Wilkinson, Jr.*, with his Atlanta accent, told of Michigan's plan of cooperating with smaller hospitals throughout the state in establishing training programs for residents. . . . *Murray C. Brown* gave us a real background picture of the Negro and his problems and pleaded for support for his group. . . . Handsome, energetic *Thomas M. Peery* is the sparkplug in the George Washington program. . . . Careful, meticulous *John E. Detrick* is doing a finished job at Cornell. . . . *Charles M. Holman*, a most promising young man, told of Oregon's fine program.

# Common Misconceptions in Regard to Dermatology

MARION B. SULZBERGER

NEW YORK CITY

IT is understandable, and perhaps inevitable, that a specialist should appreciate and appraise his particular field more highly than any other medical man. I believe, however, that when it comes to dermatology, the gap between the appraisal of the specialist and the opinions of others is much wider than usual, and that the reasons for this divergence of opinion merit and require some explanation. I hope that this paper may lead some of you to reevaluate the factual basis for your concepts concerning dermatology.

No one can deny the importance of skin diseases as leading causes of sickness and disability. This is clear, for wherever dependable figures are available, for example, in the armed forces, they show that well over 10 per cent of all disability is due to skin diseases; also, in civilian medicine, there are the generally accepted figures showing that from 60 per cent to 80 per cent of compensable occupational disease is skin disease. The latest statistics available in New York State (exclusive of New York City) show that, out of a total of some 13,000 registered cases of cancer, slightly more than 1,500 were cancers of the skin and lip. Moreover, very few people seem to be aware of the fact that skin

cancers cause more deaths than, for example, cancer of the brain.

But I believe that the poor estimation of dermatology, which prevails in many quarters, is based not so much on failure to recognize high incidence of skin diseases, but rather upon more fundamental misconceptions regarding the problems and contributions of dermatology.

## NOMENCLATURE

Dermatologists often hear such remarks as, "You use such strange and foreign-sounding names," or, "You use so many eponyms." Most non-dermatologists apparently think that our nomenclature is full of superfluous adjectives, which are intended to obscure rather than to clarify, and that dermatologists would rather give cumbersome names than study the basic mechanisms of the disease.

Admittedly, nothing can be more irritating than the needless use of foreign-sounding phrases which are meaningless to many a listener, and which connote an assumption of superiority on the part of the speaker. Is it true that dermatologists are guilty of this practice?

The skin is a large organ—indeed, the largest organ—with many complex structures and complicated functions. It is exposed to every

From the New York Skin and Cancer Unit, New York Postgraduate Medical School and Hospital.

Read before the Section on the General Practice of Medicine, American Medical Association, June, 1947.

influence coming from within and from without. It is only natural that the pathologic changes, caused by varying exogenous and endogenous agents acting upon the delicately adjusted cutaneous structures, should give rise to a great variety of distinctive pictures of disease. Furthermore, in contrast to every other organ, the tissues and specialized structures of the skin are spread over the surface and are entirely accessible to the observer's vision, touch, and other senses. Perhaps if the liver were as accessible to exact observation and description, there might be as many recognized forms of hepatitis as there now are of dermatitis. But despite these obvious reasons for a richer descriptive terminology, I do not think that dermatologic nomenclature is much more detailed than that of other specialties or of medicine in general.

For every long or eponymic name of a skin disease, I think I could supply one or two similarly constructed terms for some other disease. Admittedly, "xeroderma pigmentosum," "purpura annularis telangiectodes," "Schamberg's disease," and "Majocchi's disease" sound formidable. But what of "retinitis pigmentosa," "subacute abacterial endocarditis," "Hand-Schüller-Christian's disease," "postencephalitic Parkinsonian syndrome," "Landouzy-Dejerine's fascioscapulo humeral atrophy," and "Osler-Weber-Rendu-Goldstein familial hereditary telangiectasia"?—to mention only a few.

Why is it, then, that dermatologic terms seem especially strange and complicated to physicians outside the specialty? In my opinion, the present system of teaching medicine is, to a large extent, at fault. From the very beginning the medical student is made acquainted with a wealth of terms of general medicine, so that such names as "Hand-Schüller-Christian's disease" and "Duchenne-Erbs paralysis" become the familiar objects of his world—of his talking, writing, thinking, and dreaming. Not so with poor, neglected "dermatitis exfoliativa" or "purpura telangiectodes," which are suddenly thrust upon him for an hour or two for a few weeks during his overcrowded third or fourth year. His overburdened mind and bursting vocabulary are inclined to reject the additional



MARION B. SULZBERGER

burden. And throughout his life, on the rare occasions on which he is compelled to read or hear these dermatologic terms, the physician continues to regard them as strange cacophonies, and is inclined to suspect the man who uses such fancy language of a desire to impress, or even to confuse in order to hide his ignorance of his field.

The only remedy I can see for this situation is the introduction of dermatologic diseases from the very beginning of the medical curriculum and the proper integration of instruction in dermatology with that in other fields of medicine. If this were done, not only would there be the advantage of making dermatologic nomenclature familiar to the student, but also it would soon be found that diseases of the skin have their proper place as introductory to the study of medicine, and offer unparalleled opportunities for teaching basic medical sciences—the bacteriology, immunology, pathology, biophysics, and biochemistry of disease, and the mechanisms of therapy and healing.

## METHODS OF TREATMENT AND RESULTS

Even more important than the misconceptions regarding dermatologic terminology is the widespread belief that treatment of skin diseases has less scientific foundation and is less satisfactory than the treatment of diseases of other organs.

If the accusation "unscientific" is meant to indicate that dermatologists do not know the *exact* manner in which most of their common remedies exert their beneficial effects, then dermatology is no more and no less guilty than any other branch of medicine. Does the cardiologist who uses digitalis know the precise manner in which the conductivity of the heart is reduced by this drug, any more than the dermatologist understands just how sulfur exerts its beneficial effects in seborrheic dermatitis or acne? And the discovery and understanding of the antibacterial action of penicillin are on precisely the same scientific level as the discovery and comprehension of the antieczematous effects of coal tar. Just as a wide-awake and well-trained Fleming happened to note the inhibition of bacterial growth in the vicinity of the contaminating colony of penicillium, so did Dinde, in Lausanne, happen to note that his dog's eczema cleared up promptly after the animal had rolled in a puddle of coal tar at the edge of the road. And ever since, dermatologists have been studying the action of tar—fractionating, analyzing, and modifying its ingredients, just as others in medicine have been studying, analyzing, and modifying the extracts known as penicillin. As I see it, there can be no doubt that the dermatologic use of common remedies—sulfur, mercurials, resorcinol, arsenic, menthol, and others—is, in point of scientific foundation, wholly parallel to the use of quinine in malaria, of salicylates in headaches and fever, of morphine, bromides, and so on. In short, when one really compares the therapeutic armamentarium of the dermatologist with that of his colleagues, the one appears no whit more scientific than the other.

If the criticism "unscientific" is leveled, not at the general knowledge and basis of therapy,

but at the manner in which the individual practitioner selects and uses the available measures in a given case, then I conclude that this criticism is peculiarly unjust when applied to a competent dermatologist. For, as a natural consequence of the extraordinary accessibility of the lesions, the dermatologist is able to employ a most carefully controlled and scientific form of therapy. First of all, his therapy is exquisitely eclectic, employing everything that is known and available in medicine and surgery. Dermatology makes use of virtually every modern systemic form of medication and of every technic of surgery and electrosurgery, as well as of physical agents such as cold, heat, roentgen rays, radium, and products of atomic fission. In addition to all these implements of general medicine and surgery, the dermatologist can avail himself of a highly specialized, but generally precise, system of *local* treatment. The active ingredients of his external remedies are chosen on the basis of years, decades, and often centuries of testing their effectiveness in a given condition. The concentrations and quantities of the ingredients are carefully adjusted to the requirements and tolerances of the particular site and patient. And the combinations of ingredients and vehicles are selected to produce maximal therapeutic effects and minimal side-effects, as well as the required rate and depth of penetration, speed and persistency of action, and ease and feasibility of employment.

MORE than any other specialist, the dermatologist is dependent upon the patient's cooperation as executor of the prescribed treatment. Therefore, having prescribed a scientifically compounded remedy, the well-trained dermatologist—fully aware of the properties and purposes of each ingredient, its color, consistency, odor, solubilities, physical and chemical action—proceeds to enlighten the patient, teaching him how the remedy is to be applied and removed, and explaining what effects and possible side-effects may be encountered. Then, at appropriate intervals, both physician and patient observe the remedy's effects, possibly in



a comparative fashion by contrasting the results achieved with those produced by other remedies on similar lesions in other areas. When indicated, the physician changes the nature or concentrations of the active ingredients and of the vehicle, and modifies his prescription in the direction suggested by the effects observed.

I submit to you that the foregoing is a true description of the procedures followed by the competent dermatologist, and that it constitutes a therapeutic approach which is well founded on experience, reason and science.

Why, then, does the non-dermatologist so commonly believe that dermatologic methods of treatment are unscientific and unsatisfactory? It seems to me that some, perhaps a good deal, of this prejudice has origins similar to those which I described in connection with the matter of nomenclature. The medical student and the young physician receives painstaking instruction in the therapy of diseases of organs other than the skin. From the beginning he learns the names, pharmacology, and toxicology of the common drugs, and writes them down in prescriptions, and studies the theory and practice of their use, until at last the pharmacopoeia of general medicine becomes second nature to the average physician. Not so with dermatologic therapy, a "new" therapy, often thrust upon the student without the stimulating associations of historical development, pharmacologic experiments, or repeated practical experiences. It is not astonishing, therefore, that most physicians throughout their careers reject this inadequately presented form of therapy as unwelcome and, in addition, entirely without scientific foundation.

Your next question may well be—if dermatologic therapy is so well founded, and the dermatologic lesions are so accessible—why is it that so many physicians and laymen believe that the results achieved by the skin specialist are, on the whole, unsatisfactory? Every one of us has heard the excruciatingly amusing epigram, "Your patients never die, and never get well," which helps the misconception along.

I have been thinking about this whole question for some time, and am inclined to believe

that this misconception is due essentially to the following reasons. Since the beginning of the era of modern immunology, bacteriology, and chemotherapy, the understanding and management of disease have advanced at breath-taking speed. Somewhat dazzled by the brilliance of the actual achievements, and more confused by the high-pressure public relations work on behalf of daily medical "discoveries," a large segment of both the medical and lay public has been inclined to lose sight of the still unplumbed depths of medical ignorance. For, despite the incalculable progress of recent years, many of the most important ills of man are still clothed in mystery, and are inaccessible to any known therapy. To name only a few—the common cold, most headaches, most kinds of heart trouble, hypertension, many arthritides, kidney diseases, blood dyscrasias, cancers.

NEEDLESS to say, dermatology also has its quota of incurable and even unmanageable diseases, for the skin is a living structure, fully as delicate in its mechanisms and as manifold and mysterious in its processes as the brain or kidney or any other organ. However, when the skin is affected by a disease for which medical science has found a promising therapeutic approach, that form of skin disease will usually be more readily manageable than if the identical affection were seated in some other organ. Tuberculosis of the skin is, as a rule, more readily cured than is, for example, tuberculosis of the genitourinary tract or lungs; the same is true of such diverse conditions as many types of tumors, staphylococcic, streptococcic, and virus infections, and so on. Thus it must become quite apparent to all who care to examine the question that the prognosis for skin diseases and their response to modern therapy are, by and large, somewhat better than in other diseases. This should be construed not as a particular feather in the cap of the dermatologist, but rather as the natural consequence of his good fortune in possessing superior opportunities for earlier and more accurate diagnosis and for more direct application of scientific treatment.

As I see it, dermatology has acquired its unenviable reputation for therapeutic disappointments largely because of two factors—first, due to the *inordinately high hopefulness* and the *expectancy of cure*—on the part of both physician and patient—where skin diseases are concerned; and, secondly, the extraordinary degree of anguish which every human being experiences whenever his ego is attacked by personal disfigurement. The expectancy of cure is too high because skin lesions are often without danger, and are therefore often regarded as insignificant; and also because these lesions, being open to direct therapeutic applications, are expected to yield to treatment easily.

A PATIENT with heart disease or kidney disease or hypertension does not, usually, expect a cure when he goes to his physician. And this patient will hardly blame his doctor or the science of medicine merely because the exact cause of his trouble is unknown, or because an immediate and permanent cure is not forthcoming. But the patient afflicted with chronic eczema of the hands or scaly patches of psoriasis is likely to be shocked when told that the cause of his trouble remains a mystery, and is inclined to be despondent, not say indignant, when a rapid and lasting cure cannot be promised. The individual suffering from diabetes, high blood pressure or some disease of the heart, kidney, liver, stomach, or joints will, as a rule, expect to "treat" the condition, and will resignedly follow a strict regimen in order to remain comfortable and to continue to live. The usual patient of this kind has heard that his baffling disease is being studied by scientists all over the world; that great men, famous institutions, and prodigious sums are concentrated on a solution of his problems, but that nothing like a cure is as yet available.

But the patient with lupus erythematosus or psoriasis or chronic eczema has a different attitude. More often than not, this patient informs the skin specialist that a prompt and permanent cure is expected. He simply cannot believe that such a thing as a skin disease should constitute

a baffling problem. He chafes at the endless continuation of palliative measures. Soon he openly resents the fact that no specific relief is forthcoming; and, in his disappointment, he arrives at the conclusion that dermatologists are less competent than other practitioners of the healing art, and that dermatology is less advanced than other branches of medical science. Though unfounded, his conclusion is quite comprehensible, and receives some support from the fact that neither the press nor the radio tells him of an army of men and an array of institutions working towards the solution of his skin problems.

Nor can the dermatologic patient very well console himself with a false idea of a cure or of improvement. It is only too easy for him to see that those lumps on the end of his nose are still there, or that the redness and scaling are just about as they were a week ago. And he would hardly be consoled if he were somehow able to see that his neighbor's hobnail liver was as lumpy as ever, despite years of the best specialistic care; or that the atheromatous patches in his boss's aorta had grown larger, despite years of a rigid regimen and everything that money could buy in medical treatment.

#### CONTRIBUTIONS TO MEDICAL SCIENCE

Some of my remarks concerning dermatologic nomenclature and topical therapy may have served only to strengthen your impression that dermatology is a strange and remote specialty, and that the dermatologist thrives in a rarefied atmosphere, separated by airtight partitions from the rest of the profession. But, of course, this is by no means the case. And I should like to remind you once again that dermatologic diagnosis and therapy must constantly avail themselves of every modern approach known to medicine and surgery.

More important still, any serious attention to the question will reveal that studies of the skin and its reactions have contributed substantially to the discoveries and advances made in medicine as a whole. Examples come crowding to

my mind from every field of medical endeavor. In cancer and carcinogenesis, the most fruitful modern approaches stemmed from the recognition of the causes of such *skin* tumors as arsenical cancers, chimney-sweeps' cancer, cancers due to dyes such as aniline and scarlet red or their contaminants, cancers due to trauma, to burns, light, roentgen rays, and radium. Also, the research work of the Japanese, and of Br. Bloch and the Swiss school with experimental tar cancers of the skin of mice, led to Br. Bloch's discovery and separation of the individual carcinogenic fractions of tar distillates; this development, together with subsequent isolation by Cooke of modern chemical carcinogens, dibenzanthracene and methyl-cholanthrene, ushered in the new era of experimentation with carcinogens, including the use of the 17-ketosteroid compounds.

IN THE domain of infections, too, dermatologic research has often led the way. Let me only recall that the dermatologist Neisser discovered the gonococcus; that the dermatologist Hoffman, together with Schaudinn, discovered the spirochete of syphilis; and that, of course, many of the dyes and many staining methods and culture media still used were also introduced by dermatologists (Neisser's bacteriologic stains, Unna-Pappenheim's histochemical stains, Sabouraud's mycologic media, etc.). The immunology of infections owes much of its scientific foundation to observations of the skin's resistance or susceptibility to infections and reinfections, and to intracutaneous injections of extracts of micro-organisms. Jenner's epoch-making discovery of smallpox vaccination (1798); Koch's "fundamental experiment" and observations of tuberculin skin reactions; Schick's magnificent contribution of the toxin skin test and diphtheria immunization, and the recognition of the role of hypersensitivity in asthma and hayfever and hives; and Wilhelm Frei's clarification of the entire picture of that protean disease known as lymphogranuloma venereum—these are only a few of the better known examples. Less well known are the der-

matologic studies in tuberculids and trichophytids, and in the chemistry and immunology of tuberculins and trichophytins; we must not forget the early recognition of the immunologic role of the polysaccharide fraction (Bloch, Labouchère and Schaaf, 1924).

It is also evident that few outside of the specialty realize that dermatologists were among the first to pay much attention to the concept of disease due to *foci* of infection. Let me remind you that it was the research work of Darier in tuberculids and with tuberculin, and of J. Jadassohn in trichophytids and with trichophytin, which introduced the concept of the role of foci of infection, and established the allergic nature of many disease processes due to dissemination of infectious agents and their products emanating from a distant focus.

From Jenner and Koch to Frei, Schick, Schwartzman and Rous, the use of the skin as a test-tissue in studying the effects of infection and reinfection, and of the introduction of products of micro-organisms and virus, has served to secure the very foundations of our present knowledge concerning susceptibility and resistance to infectious disease. Thus, the study of skin reactions and the observations of dermatologists generally have not only made contributions to our understanding of immunology in infections but to the study of immunology as a whole.

Drug reactions, those common and most instructive forms of disease, are now beginning to receive their merited attention from the profession as a whole, thanks to the widespread use of the sulfonamides and penicillin. Yet almost every known form of reaction to drugs had been not only recognized but accurately described and intensively studied by dermatologists for a long time. Indeed, little has been added to the basic knowledge of drug reactions, as set forth in the dermatologic literature before the turn of the century (e.g., Price Morrow's monograph and J. Jadassohn's masterly expositions, in 1895).\*

\*See for example "A contribution to the study of dermatoses produced by drugs," Selected Essays and Monographs. London: the New Sydenham Society, 170:205, 1900.

In the general sphere of sensitization to simple chemical compounds, dermatologists have preceded all others, both clinically and experimentally. Dermatologic investigation of skin sensitization by such chemicals as mercurials, arsenicals, bromides, iodides, phenolphthalein, paraphenyldiamine, azo dyes, and local anesthetics, has supplied countless clarifying facts and concepts; and the first use of simple chemicals in producing sensitization in laboratory animals must be credited to the dermatologic studies of J. Jadassohn and his school, of Wilhelm Frei and co-workers (arsphenamines), R. L. Mayer (paraphenyldiamine), and W. Jadassohn (phenylhydrazine). These studies paved the way for the splendid achievements of K. Landsteiner, Merrill Chase, and others.

I cannot recite the many other pertinent examples. In whatever direction one looks, one will see—provided one is willing to see—the scientific facts gleaned through the study of the skin. Unna's gigantic contributions to the budding science of histochemistry, Bloch's very

early recognition of the role of enzymes in the human tissues (dopa-oxidase and melanin formation), the exemplary studies of Sir Thomas Lewis and his school, and of Landis and others on the minute blood vessels of the skin and on histamine and histamine-like effects; and now the work on the "anti-histamine" drugs, the studies of cutaneous water-metabolism, heat regulation, secretory functions, self-sterilizing powers, responses to psychogenic stimuli—these are but a few more examples of the real and intimate connection between studies of the dermatologist's organ and the advancement of general medical and scientific knowledge.

In short, dermatology—that ugly duckling of American medicine—has contributed its full share toward the advancement of knowledge. And it is now in a position to make further great contributions, provided its vast potentialities are recognized and its unique opportunities fully employed. To paraphrase again, I should like to say for American dermatologists, "Give us the facilities, and we will do the job."



#### EARLY RADIOGRAPHY

Surgeons, hampered in the use of the x-ray in private houses, where there was no electric power, devised the scheme of obtaining their power from the storage batteries of their automobiles. The wires were carried directly from the automobile in the street to the patient's room.

*Photo from: The Bettmann Archive*

# Pancreatic Fistula Following Surgery of Pancreatic Cyst

## REPORT OF A CASE TREATED BY PANCREATOJEJUNOSTOMY

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**B**ECAUSE of the relative rarity of pancreatic cysts, the subject has merited only an occasional reference in the literature and scant attention in the textbooks. Congenital cystic disease of the pancreas is an uncommon pediatric entity of unknown etiology. Retention cysts of the pancreas may be due to either an obstruction of the duct or compression on a duct from without. Cystic neoplasms may be congenital or acquired, and include the dermoids, teratomas, cystadenomas, and epitheliomas. Pseudocysts resulting from necrosis or interglandular hemorrhage can also occur. Pancreatic duct obstruction and trauma have been listed frequently as aggravating factors in the production of pancreatic cysts. Many physicians consider an associated and pre-existing pancreatitis as an etiologic agent.

The treatment of pancreatic cysts is surgical and depends largely upon the degree of adherence of the cyst wall to adjacent vital structures. Ideally, complete excision is the method of choice. If this is not feasible, however, either drainage with marsupialization or, as has been

recently advocated,<sup>1</sup> an immediate anastomosis of the cyst to a portion of the small bowel must be performed.

Not infrequently a pancreatic fistula develops as a postoperative complication following marsupialization of the cyst. With the establishment of a persistent fistula, a gradual physiologic imbalance soon becomes evident. Very detailed observations on the flow of pancreatic juices from pancreatic fistulas have been made by Wiper and Miller.<sup>15</sup> They correlated an increase in the plasma proteins, hematocrit and hemoglobin with dehydration and a corresponding loss of chlorides and sodium. Zinniger observed a reduced blood count and also a lowered plasma protein level in the one case of pancreatic fistula he reported.<sup>16</sup>

Various attempts have been made to reduce the amount of drainage from an exteriorized pancreatic sinus. Comfort and Priestley found that a high-fat, high-protein, low-carbohydrate diet markedly reduced the flow.<sup>6</sup> X-ray therapy, sclerosing solutions, and curettage have all been tried with varying degrees of success. Correction of the fluid and electrolyte balance, transfusions to combat the anemia, and supplemental protein therapy all tends to restore the patient to an optimum physical state and to encourage closure of the sinus tract.

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Surgical intervention for persistent pancreatic fistulas following pancreatic cysts is a relatively uncommon procedure. Of the 26 cases reported in the literature in the last decade (see all references except 2 and 15), 13 closed spontaneously; this is probably the most common result when ideal conditions for healing exist. One case was operated on a second time and the sinus tract completely resected; technically, this procedure is a difficult one and has generally been unsuccessful. Four cases were reported cured with an anastomosis to the stomach. Here, the question has been advanced as to whether or not it is advisable to transplant a draining pancreatic sinus into the stomach since the glandular ferments are thereby lost in the lowered gastric pH. Especially would this be true if the sinus drained from the head or body, or both, of the pancreas.

Kirschner,<sup>9</sup> as early as 1929, reported a successful pancreatoduodenostomy for persistent pancreatic fistula. In 1937 the details of pancreatojejunostomy were described, and since then, this procedure has been commonly employed.<sup>10</sup> If the sinus tract has a small opening, a purse-string type of implantation is done; if the tract has a wide opening, an end-to-side anastomosis is recommended.<sup>2</sup> The important complication of pancreatojejunostomy is obstruction of the implanted tract with reformation of the cyst.

#### CASE REPORT

A white male, 52 years old, was admitted on January 22, 1947, because of a pancreatic fistula which had been present for the preceding eight months. Two years before his admission he first had had attacks of abdominal pain, for which he was hospitalized in February, 1945, and put under observation, but no treatment was started. Because of continuous pain and the presence of an abdominal mass, he was again hospitalized in May, 1946, and an exploratory operation was performed. A large pancreatic cyst was encountered near the head of the pancreas; this was drained and marsupialized. Several months later a catheter was



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inserted into the fistulous tract to facilitate drainage; this was still in place at the time of admission to this hospital.

The patient remained relatively asymptomatic, except for the constant daily drainage of approximately 200 cc. of clear, colorless fluid from the sinus opening. There was little or no excoriation of the surrounding skin. Bowel movements were frequent (4 or 5 a day) and were described as frothy in nature. Laboratory examinations revealed a hemoglobin of 85 per cent with 3,950,000 red blood cells and 8,000 leucocytes, with a relative lymphocytosis. The serum amylase was reported as 98 units. Total plasma proteins were given as 5.02; blood chlorides as 450 mg. per cent. An analysis of the drainage revealed a predominant presence of amylase to the extent of 200 mg. per cent.

A lipiodal injection of the sinus tract showed that it proceeded rather irregularly from the anterior abdominal wall to within 4 cm. of the anterior vertebral margin. The patient was

placed on an antidiabetic diet and was given small doses of ephedrine sulfate and sodium bicarbonate. In addition, he was given large amounts of protein both orally and parenterally. One month after admission (nine months after the original drainage and marsupialization) the plasma proteins showed a substantial increase from 5.02 to 6.07 and the hemoglobin was reported at 14 gm. or 88 per cent with 4,310,000 red blood cells, but the amount of drainage had decreased only slightly. Two attempts to inject the tract with sclerosing solution had proved unsuccessful.

ON February 26, 1947, operation was performed. The fistulous tract was carefully dissected down to, but not through, the gastrocolic omentum. A No. 16 catheter was then inserted into the fistulous opening and maintained in place by a black silk ligature through the tube and surrounding the sinus tract. Here, because of the large cuff of tissue, the original Lahey technic was abandoned. With the tract and catheter held in place by stay sutures, a double row of interrupted sutures (instead of the purse-string suture) was made, thus joining the jejunum with the sinus tract.

The patient made an uneventful postoperative recovery. The abdominal incision healed slowly but completely; all blood chemistry and liver function tests were within normal limits. Bowel movements had returned to 2 or 3 a day and were of normal color and consistency. Accordingly, discharge from the hospital was granted on April 23, 1947.

#### CONCLUSIONS

1. Pancreatic cysts are uncommon occurrences. The accepted methods of treatment are (a) excision, (b) drainage and marsupialization, and (c) immediate anastomosis to a portion of the bowel.

2. The most common complication following drainage and marsupialization of a pancreatic cyst is the establishment of a persistent pancreatic fistula. A large percentage of these



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close spontaneously. If spontaneous closure does not occur within a reasonable time under supportive medical treatment, a transplantation of the fistulous tract into the bowel is considered necessary.

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# Spontaneous Rupture of the Esophagus

## REPORT OF A CASE WITH IMMEDIATE DIAGNOSIS AND SUCCESSFUL SURGICAL REPAIR

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SPONTANEOUS perforation of the normal esophagus is a rare event. Approximately 60 cases have been recorded in medical literature. Ante-mortem diagnoses have been made 14 times, and most of these diagnoses were made in those instances in which the patients survived the first few hours after the onset of the illness. Spontaneous rupture of the esophagus is such a dire catastrophe that very few of the patients have lived more than forty-eight hours. In only three instances has the diagnosis been made sufficiently early to permit surgical exploration of the thorax with repair of the torn esophagus. The patients reported by Collis and his associates and by Foggitt lived for only a few hours after operation. Kinsella's patient seemed to be well on the road to recovery when he succumbed to a pulmonary embolus on his eighth postoperative day. Four instances of survival after spontaneous rupture of the esophagus are recorded, and three of these were late cases in which recovery followed drainage of empyema and subsequent sealing off of the esophageal fistula. A very brief account of the fourth case was given by Cummings. The patient was a man 50 years of age with subcutaneous emphysema and bilateral

hydropneumothorax. He was operated on by Dr. Overholt of Boston several days after the esophagus had ruptured. Cummings stated that the patient recovered.

The case here presented is of unusual interest. We were able to observe the dramatic sequence of events which characterizes a spontaneous rupture of the esophagus. To our knowledge this is the only reported case of true spontaneous perforation of the esophagus in which an immediate diagnosis was followed by successful transthoracic repair of the torn esophagus with recovery of the patient.

### REPORT OF CASE

A white man, aged 39 years, became acutely ill on May 17, 1947. For forty-eight hours prior to the onset of this illness he had been drinking heavily and had eaten little or no food. He had consumed a large amount of liquor the night before and had fallen into a drunken sleep about 2:00 A.M. He awoke late the next morning and was very thirsty. At noon he drank 2 quarts (2 liters) of cold milk. Some upper abdominal discomfort developed. At 1:00 P.M. he drank a large glass of milk. He became nauseated and began to vomit and retch vio-

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lently but was unable to empty his stomach. Suddenly a very severe pain developed in the lower substernal region, the epigastrium, and the lower thoracic portion of the spinal column. A physician was called, who found the patient writhing in pain, yelling, and tossing about in bed. A  $\frac{1}{4}$  gr. (0.016 gm.) of morphine sulfate and  $\frac{1}{150}$  gr. (0.00043 gm.) of atropine were given without perceptible relief of pain. The patient was sent to a hospital by ambulance.

Physicians at the hospital found the patient suffering from intense pain, which was most severe in the back but also involved the left side of the thorax and the substernal region. He was cold and clammy and rather markedly cyanotic. His pulse rate was 126 beats per minute. The blood pressure was 140 mm. of mercury systolic and 80 diastolic. Examination was difficult because the patient groaned and tossed about continually. No breath sounds could be heard over the left hemithorax. A second hypodermic injection of morphine sulfate failed to

relieve the pain. A nasal tube was passed into the stomach because the presence of a perforated viscus was suspected.

Roentgen examination of the thorax revealed left hydropneumothorax (Figure 1). The left lung was collapsed, and fluid was present up to the level of the sixth rib posteriorly. Leukocytes were found to number 18,500 per cubic millimeter of blood.

A clinical diagnosis of spontaneous rupture of the esophagus was made, and exploration of the thorax was advised despite the patient's critical condition. The patient was brought to the operating room approximately three hours after his pain developed. Nitrous oxide, ether, and oxygen were administered. The following is a description of the surgical procedure: "A curved posterolateral incision was made on the left. A long segment of the sixth rib was resected and the pleura was opened. There was a large quantity, at least 2 quarts (2 liters), of curdled milk, gastric juice and bile. The pleural surfaces were intensely irritated and inflamed and the lung was completely collapsed. The pleural space was evacuated and a rupture of the esophagus about 3 or 4 cm. long was found just above the diaphragm. The left phrenic nerve was crushed to paralyze the diaphragm. The opening in the esophagus, which was a vertical tear, was closed with three rows of catgut. The pleura was brought across for additional protection. The operative site was washed again and I believe completely emptied of all its contamination. The lung was inflated. One catheter was inserted anterolaterally at the fourth interspace, one at the eighth interspace posterolaterally and one at the seventh interspace into the mediastinum itself for temporary closed drainage. A nasal tube was inserted to provide a means of postoperative feeding. Prognosis is very poor because of extensive mediastinitis and pleural infection."

**A**FTER the operation the patient remained in a critical condition for approximately forty-eight hours. Cyanosis persisted, and the systolic blood pressure remained very low. His

condition was improved with a transfusion of 500 cc. of whole blood. As he gained strength, he became very restless and uncooperative. These manifestations were controlled by the intravenous administration of 5 per cent alcohol given with glucose and saline solutions. On the third postoperative day the patient pulled out his nasal tube. Four days after his operation administration of sips of water was begun and the oral administration of fluids was increased. On the eighteenth postoperative day bland foods were permitted and were tolerated satisfactorily.

Immediately after the operation the intramuscular administration of penicillin and streptomycin was instituted. Thirty thousand units of penicillin and 0.25 gm. of streptomycin were given every three hours for ten days after operation. Drains were removed from the thorax on the seventh day after operation. The patient's temperature varied from 100° to 102° F. for ten days after operation. After the thirteenth day he was afebrile. No infection occurred in the mediastinum or pleural space, but the external incision became infected and required superficial drainage. The patient was dismissed from the hospital on the twenty-first postoperative day.

This patient has been followed carefully since his dismissal from the hospital. He has gained in weight and strength and is back at work. He has not experienced dysphagia, and the roentgenographic examinations made after he had swallowed a barium meal (June 30, 1947) showed surprisingly little deformity of the lower part of the esophagus (Figure 2). The left hemidiaphragm was elevated and immobile and there were multiple pleural adhesions in the lower portion of the left pleural space. At the time of this writing, more than three months since the patient left the hospital, he is leading a normal and temperate life.

#### COMMENT

It is of interest that this patient underwent a complete examination at the Mayo Clinic in February 1946, because of vague digestive



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symptoms. He had had some nausea and epigastric burning. Roentgenographic studies of the esophagus and stomach gave negative results at that time. It was felt that his symptoms were on a functional basis and were probably related to his excessive use of alcohol.

#### CLINICAL ASPECTS

Why does the normal esophagus rupture? This is a difficult question to answer. Most authorities feel that a tremendous increase of intraesophageal pressure is responsible for the split. In violent vomiting and retching it is probable that the muscular sphincter at the cricoid level of the esophagus fails to open, thus permitting the overdistention of the esophagus with regurgitated contents. The esophagus ruptures at its weakest point, just above the cardia.

A review of many of the case reports reveals a striking similarity in the history, the phys-

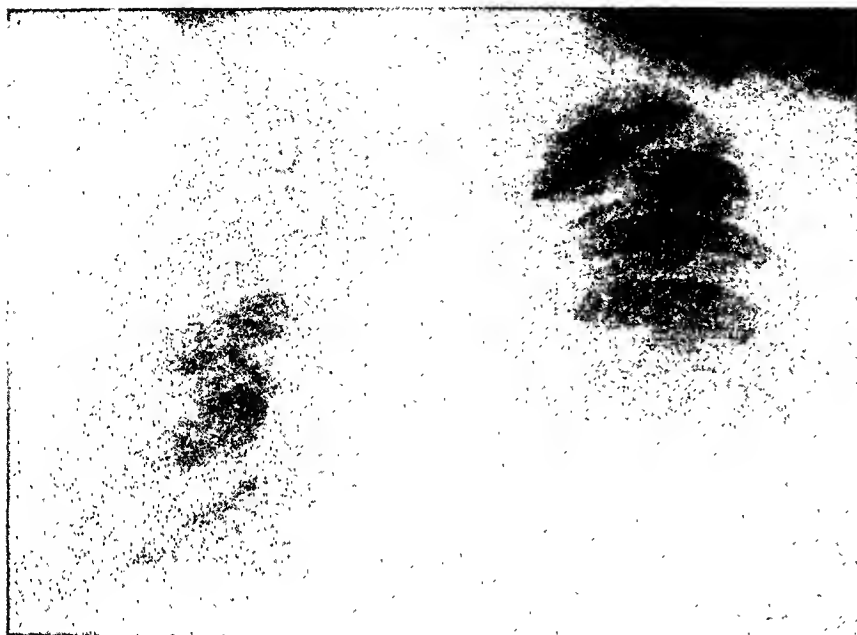


Figure 1. Roentgenogram of the thorax taken May 17, 1947, upright position showing the left hydro-pneumothorax.

ical findings, and the clinical course of those patients who have experienced a spontaneous rupture of the esophagus. Most of these patients were male and many of them indulged excessively in alcoholic beverages. Heavy eating was a predisposing factor in a large number of cases. Severe vomiting almost invariably preceded the intense substernal and epigastric pain. This pain usually was referred to the region of the lower thoracic portion of the spinal column and often to one side of the thorax or the other. Opiates afforded little if any relief. In practically all instances vomiting ceased with the rupture of the esophagus. The intense pain, the cyanosis, and extreme prostration that these patients exhibit are much more marked than one might expect in a person with a perforated abdominal viscus. In a few hours most of these patients are moribund.

On examination the pulse is weak and thready, though not necessarily rapid. In at least half of the cases subcutaneous emphysema is seen, especially if the patient is observed several hours after the onset. Subcutaneous emphysema appears first in the supraclavicular regions and spreads rapidly to the face, thorax, and upper extremities. Also, there is very likely to

be evidence of hydro-pneumothorax on examination, a fact that can be readily confirmed by roentgenography of the thorax if the roentgenogram is made with the patient in the upright position. Examination of the abdomen may reveal marked rigidity. In fact the abdominal signs are likely to predominate in any perforation of the lower part of the esophagus, and exploration of the abdomen has been carried out a good many times. The presence of either subcutaneous emphysema or hydro-pneumothorax should serve to differentiate acute rupture of the esophagus from acute abdominal conditions. In some instances the roentgenogram made of the thorax will show mediastinal emphysema or a fluid level in the mediastinum before physical signs are evident.

In differential diagnosis the conditions to be considered include perforation of an abdominal viscus, acute pancreatitis, coronary occlusion, and spontaneous pneumothorax. However, the diagnosis of spontaneous rupture of the esophagus is not difficult if one considers the possibility. A history of vomiting, the intense pain, cyanosis, and shock, and the presence of either subcutaneous emphysema or hydro-pneumothorax should enable one to make the diag-

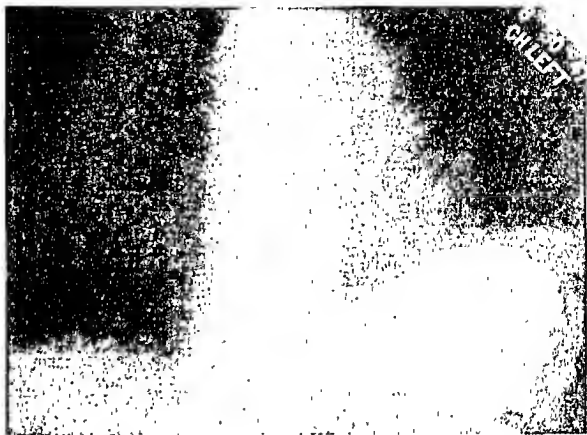


Figure 2. Roentgenogram of esophagus and stomach made June 30, 1947, which revealed only slight deformity at the site of the previous rupture of the esophagus.

nosis. In case of doubt, pleural fluid can be aspirated and tested for its acid content. This has been done by Aldrich and Anspach and others. However, when rupture of the esophagus is suspected there is no time to temporize. Immediate transthoracic exploration is justified.

#### TREATMENT

The patient who has spontaneous rupture of the esophagus presents a serious problem to the surgeon. The operative risk is great, but there is no alternative and each passing hour lessens the chance of survival. In 1926 Williams and Boyd recommended immediate thoracotomy. In 1944 Collis and his associates attempted this, but their patient did not survive. Kinsella's patient would have survived had it not been for an unfortunate pulmonary embolism. Fogditt performed abdominal exploration twenty hours after the onset and pulled the esophagus down into the abdomen where he repaired the slit in the esophagus, but his patient died.

It is recognized that the lowermost portion of the esophagus is its weakest point. Practically all the spontaneous perforations reported have occurred just above the diaphragm. A clean longitudinal slit 2 to 5 cm. in length is usually

seen. Perforations occur more commonly on the left than on the right side. In at least 2 instances (including Boerhaave's case) the esophagus was torn completely across.

It is impossible to draw conclusions on the basis of one case in which treatment was successful. We feel that immediate transthoracic exploration, however, with repair of the esophagus is the procedure of choice. The use of both penicillin and streptomycin is advocated in these cases, as the inevitable contaminating substances in the pleural and mediastinal cavities will contain a great variety of bacteria. Drainage of both the mediastinum and the pleural space is also indicated. Blood transfusions are essential in combating shock, and parenteral administration of fluids is likewise desirable. A nasal tube can be inserted into the stomach at the operation time to facilitate feeding.

We believe that the transthoracic approach is preferable to the posterior mediastinotomy suggested by Eliason and Welky and by Klein and Grossman. We would agree with Barrett that in case of doubt a left-sided approach is preferable. All authorities agree that immediate diagnosis and immediate operation are imperative for rupture of the esophagus.

# The Diagnosis and Treatment of Arterial Hypertension

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**H**IGH blood pressure is not a disease *sui generis*, but is a clinical manifestation which may occur in a variety of disorders. For practical purposes, hypertension may be classified into primary or essential, and secondary hypertension. In the latter class, glomerulonephritis, pyelonephritis, polycystic kidneys, suprarenal growths, pituitary tumors, and other endocrine disturbances are the outstanding causes. For the present, attention will be devoted entirely to the primary or essential type. It is the most important form, is by far the commonest, and accounts for about 80 per cent of all hypertension.

Despite the prodigious literature and extensive research on the subject, there is as much confusion as ever in the minds of physicians concerning this disorder. Since the etiology, pathogenesis, and clinical course are not known with any certainty, the treatment still is empirical. We are in a paradoxical situation, for, even though we have more knowledge, we still have little clear understanding. Some of the confusion arises from failure to understand the natural history of high blood pressure; that is, there is lack of knowledge concerning the inci-

dence, the mode of development, and the clinical course. Some hypertensives run a rapid course leading to complications and death early in the disease, whereas others are destined to have a long and useful life with little or no inconvenience from their blood pressure.

Since the introduction of the sphygmomanometer into clinical medicine at the beginning of the century, the recognition of hypertension has become so common that in many cases it is questioned whether this is an abnormality of significance. But one must not ignore the fact that the common complications of hypertension head the list of causes of death.

Confusion is increased when patients are found to have elevated blood pressure and continue to live without further signs or symptoms of the disease for many years. The size of this group of symptomless and signless hypertensives is unknown, but it must be very large, since experience teaches that some persons with hypertension may live comfortably for over twenty-five years. Confusion in the minds of both physicians and patients is accentuated when they see patients of this large group treated radically—medically and surgically.

At the original meeting of the Foundation for High Blood Pressure, it was rightly emphasized

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that one of the first requirements in the study of hypertension would be as complete as possible an investigation of the natural history of essential hypertension.

#### SIGNIFICANCE OF HIGH BLOOD PRESSURE

Because of the uncertainty which surrounds the etiology, pathogenesis, and course of hypertension, a satisfactory classification is not possible at the present time. To consider high blood pressure as a mere manifestation of some underlying disorder is quite customary, and a distinction has been developed between hypertension and hypertensive disease. Allbutt fifty years ago distinguished hyperpiesis or hypertension from hyperpiesia, which corresponds to our hypertensive disease. One indicates high blood pressure alone; the other implies a disease of the vascular system and its sequelae throughout the body.

While in a given case the exact level of the blood pressure may have little significance, in a large series of cases the magnitude of the blood pressure becomes more important as a prognostic factor. As a rule, the higher the pressures, the more certain one is to develop unfavorable complications early. In 1925, May pointed out that the mortality rate from hypertension strongly increases with elevation of pressure.

Murphy and associates in 1932 made a study of 375 autopsied cases of essential hypertension. Of this group, it was seen that 50 per cent of deaths were caused by heart disease, 10.4 per cent by renal failure, and 13.4 per cent by cerebral complications (see Table 1). Table 2 also shows the causes of death in 135 autopsied cases of hypertensive disease in the year 1946.

The blood pressure, especially in the benign phases, may fluctuate greatly, even within a period of twenty-four hours. When all these factors are considered, it is easily seen that the height of the blood pressure itself is not the factor of greatest consequence, but it is the kind of material in the arterial tree, the heart, and the kidney which determines the destiny of the patient suffering from high blood pressure.



FRANCIS D. MURPHY

Recently I examined a patient who has had a systolic pressure above 170 mm. and a diastolic in excess of 100 for forty years. Because of this hypertension, he was rejected for life insurance more than forty years ago. At the present time, he has no signs or symptoms of this hypertension, except for a slight cardiac hypertrophy.

A CHARACTERISTIC feature of essential hypertension in its early stages is its lability. Fluctuations are common in the earlier periods and may vary greatly from time to time. As the disorder continues, there is a tendency for the blood pressure to become fixed at a higher level. The causes of these marked variations in the levels of blood pressure are not entirely unknown. Sometimes the blood pressure may fall spontaneously from a high level and remain normal for months. It is known that blood pressure may fall to normal following a brief period of bed rest during an acute infection or after a change in one's way of living. Clinicians of ex-

TABLE 1  
CAUSES OF DEATH IN 375 AUTOPSIED CASES  
OF ESSENTIAL HYPERTENSION

Cause of Death	Number of Cases	Per Cent
Heart disease .....	188	50.0
Renal failure .....	39	10.4
Apoplexy or thrombosis and embolism .....	50	13.4
Infections .....	375	14.2
Miscellaneous .....	53	12.0
Total .....	45	100.0

perience know that following myocardial infarction, blood pressure may fall to normal and then remain normal for years after the heart condition has healed.

It is the elevation of the diastolic pressure which is of most concern. Although the systolic blood pressure may vary a great deal, the diastolic phase tends to fluctuate less. Isolated cases of elevated diastolic pressures above 100 with a systolic pressure within normal limits (140 mm.) are reported, but they are rare. The width of the pulse pressure is considered of some prognostic guidance in some cases. It is an unfavorable sign when the diastolic pressure remains persistently at a high level and the systolic pressure tends to fall. Furthermore, if the diastolic pressure rises to 130 mm. and remains persistently at this level or above, malignant hypertension must be suspected.

From what has been said, it is evident that the level of the blood pressure is much less important than is the ability of the arteries, the heart, and the kidneys to withstand the strain of the pressure.

#### PROGNOSIS OF HYPERTENSION

Since the days of Janeway, optimism in arterial hypertension has been steadily increasing. Although he found prognosis better than it was usually considered in his day, it may be concluded at the present time that even Janeway was too pessimistic.

Bechgaard, in a follow-up examination of 1000 patients suffering from hypertension,

TABLE 2  
CAUSES OF DEATH IN 135 AUTOPSIED CASES OF  
HYPERTENSIVE DISEASES IN THE YEAR 1946

Cause of Death	Number of Cases	Per Cent
Heart failure .....	62	45.9
A. Coronary sclerosis .....	(26)	(41.9)
B. Myocardial degeneration .....	(24)	(38.7)
C. Myocardial infarction .....	(12)	(19.4)
Cerebrovascular accidents .....	18	13.3
Uremia .....	11	8.1
Pulmonary embolism .....	8	5.9
Pyelonephritis .....	5	3.8
Nephrosclerosis .....	1	.8
Causes other than above .....	30	22.2
Total .....	135	100.0

found 71 per cent of these patients alive after a period of seven to eleven years. In most cases, he found that one-half of the patients were in good health and on the whole were not inconvenienced by their hypertension. Furthermore, almost one-fourth were completely free from symptoms. A little less than one-half were actually inconvenienced, but in a significant number of these cases, the symptoms might pass and be explained by some other disease or the age of the patient. He also points out that prognosis is much better in women than it is in men.

Since patients of the hospital type are more commonly used for prognosis than the ambulatory kind, it is generally held that the prognosis in hypertension has been too dark. Patients who apply at a clinic for aid or go to the hospital are usually those who are sick, but statistics drawn from this group are apt to ignore the fact that a very large group of hypertensives are not sick at all and don't even know they have high blood pressure.

How long a patient will live with high blood pressure before one of the common complications sets in is a matter about which we have little understanding. For purposes of prognosis, hypertension in individuals over 40 may be rapidly progressive, while hypertension in individuals over the age of 60 years usually takes a benign, calm course with few of the disastrous complications.

## CHIEF COMPLICATIONS OF HYPERTENSION

Many patients with essential hypertension live for years without any added difficulty, but common complications that must be considered are heart failure, renal insufficiency, cerebral disorders, and malignant hypertension. A complete diagnosis of hypertension requires more than merely estimating the height of the blood pressure at the time of the patient's visit. Recognition of the prodromes of the complications should be made as early as possible if full benefit is to come from treatment.

A study of the hypertensive requires a few simple but precise examinations:

1. The height of the blood pressure is determined, and by subsequent observations, it is learned if the pressure has become fixed at a high level or if it fluctuates. The presence of marked fluctuations indicates that the hypertension is more functional than organic.

2. Since every patient with high blood pressure is in imminent danger of developing heart disease, an early appraisal of the condition of the heart must be made.

3. Although only few cases of hypertension develop renal failure and die of uremia, knowledge may be obtained concerning the functional capacity of the kidneys.

4. Cerebral vascular disease constitutes one of the serious complications of hypertension. Although we are in a position to examine and appraise the condition of the heart and kidneys, it is not easy to recognize impending dangers in the blood vessels of the brain. Ophthalmoscopic examination, however, reveals the condition of the arterioles in the retina, and for practical purposes, we may say that a study of the eyegrounds is helpful in a study of the blood vessels of the brain itself. Furthermore, experience proves that the old dictum is true—that the eyeground is a mirror of the kidney, and when albuminuric retinitis sets in, the kidney is usually badly damaged. Of course, the albuminuria has nothing to do with the damage in the eyegrounds. So-called "albuminuric retinitis" is an indication of hypertensive encephalopathy; thus, it is seen that a study of

the eyegrounds gives us firsthand information concerning the kidney, the blood vessels of the brain, and the severity of the hypertensive process in general.

## THE HEART AND HYPERTENSION

The impending danger of heart disease in hypertension has been recognized universally, but usually the disorder is neglected until heart failure sets in, when little but symptomatic relief is possible.

Hypertensive heart disease may display itself as angina pectoris, coronary insufficiency, coronary occlusion, or congestive heart failure. In all cases there exists a disproportion between the blood supply and the increased heart muscle mass which eventually results in myocardial insufficiency. Auricular fibrillation, flutter, or advancing coronary disease may be precipitating factors in causing the heart to fail. But there are other factors which may change the picture from one of impending heart failure to one of imminent failure, such as excessive physical exertion, acute infections, and traumatic injuries.

In hypertension of moderate degree, the heart may be greatly enlarged, whereas, when there is excessive hypertension, heart enlargement may be negligible. There are several important signs and symptoms which betray the onset of myocardial insufficiency in hypertension. Although the heart may remain enlarged for years and the patient may tire out more easily than usual, the ability of the heart to withstand the strain of hypertension is amazing. In this period before the heart breaks down, radical measures (surgical treatment) are advocated.

It is the left ventricle of the heart which bears the brunt of the blow in hypertension, and it is this chamber that usually fails first. The presence of râles in the bases of the lungs may be the first evidence of left ventricular insufficiency. Along with these go paroxysmal nocturnal dyspnea and sometimes dyspnea on exertion. Physical examination at this time may also show a systolic mitral murmur, which is evidence of dilatation of the heart. This mur-



mur indicates that the mitral ring has become dilated and that mitral insufficiency exists. It may last for a few days, and then, as the heart picks up its reserve, it may disappear. Auricular fibrillation may set in and aggravate the already weakened heart, but the irregularity which is most common is the gallop rhythm. This rhythm is characterized by three beats instead of two. The gallop sound is easy to recognize but is often overlooked. This third sound occurs immediately before the systolic beat, but it is not a part of the systolic phase. Sometimes the gallop rhythm lasts for only a brief period, but when it is recognized, it is clinching evidence that the heart has begun to weaken and that heart failure is imminent.

Once the left ventricle has failed, the patient's future is full of uncertainty. Treatment at the beginning of left ventricular failure may be followed by a speedy recovery, but a temporary one. Within a short period of a few months, the same old story repeats itself. The episodes of left ventricular failure become more prolonged, and finally the right ventricle fails, too. The result is complete heart failure from which the patient does not recover.

IT is well known that the control of hypertensive heart disease rests upon the control of the high blood pressure. The question arises if other nonsurgical measures may accomplish satisfactory results in many cases. It is quite evident that many hypertensives developing heart disease have a progressive kind of disease which cannot be headed off by ordinary methods. It must be remembered that the various operations being recommended are drastic, major types and that there may be some objectionable and uncomfortable complications from them. It seems that such operations are for a limited number of very carefully selected cases.

This kind of radical treatment should be reserved for selected patients who have a progressive type of hypertension—which cannot be controlled by simpler measures—and who are suffering and in whose cases there is impending danger of serious complications.

## THE KIDNEY IN HYPERTENSION

There is no unanimity of opinion concerning the role of the kidneys in essential hypertension. In ancient times the kidney and blood pressure relationship was known, for Volhard mentions a Chinese physician, Choun-You-J, as giving the following pulse rule: "When the pulse upon deep pressing is very firm and upon superficial palpation very tight, then the disease has its seat in the kidney." In Bright's day and for the next half a century, hypertension was believed caused by renal disorders; then opinion changed and the kidney was thought to have no part in the etiology of hypertension.

Certain renal diseases are known to cause hypertension. In this category are glomerulonephritis, pyelonephritis, cystic diseases of the kidneys, and obstructive uropathies. But it is the relationship of essential hypertension to the quite-normal-appearing kidney which has caused most discussion.

Following the special work done by Goldblatt in producing hypertension by rendering the kidney ischemic, opinion shifted again to the kidney as the chief offender in hypertension. In this work, Goldblatt emphasized that the hypertension which results was not associated with defective kidney secretion.

The pathogenesis of hypertension is unknown, but that essential hypertension is the result of a pressor substance circulating in the blood, is the view widely held. Page and associates hold that as a result of disturbances in the circulation of the kidney, renin, activated by a renin-activator in the blood, is elaborated and results in formation of angiotonin (pressor substance) which causes peripheral vascular constriction, augmentation of the heart beat, and hypertension. An alternative hypothesis to explain the role of the kidney in hypertension is that the kidney elaborates a humoral agent essential for the well-being of the body; in the absence of this agent hypertension results. Other hypotheses have been advanced, but so far none is more than speculation.

Although the kidney may show signs of insufficiency during the course of essential hyper-

tension, renal failure occurs in less than 10 per cent of cases. The presence of albumin in the urine, the inability of the kidney to concentrate to a specific gravity of 1.020, and fixation of specific gravities at lower levels point to renal insufficiency. Many times the kidneys are impaired in their ability to clear urea satisfactorily or to secrete phenolsulfonephthalein adequately, although hypertensives who live for many years develop the primary contracted or shrunken kidney. Yet kidney impairment to a point of insufficiency is usually not an important complication.

#### CEREBRAL LESIONS

Concerning the cerebral complications of essential hypertension, statistics from various clinics show practically the same figures of about 12 to 16 per cent of cases. The transitory cerebral phenomena in hypertension are due to cerebral vasoconstriction. Such things as epileptiform convulsions, transient hemiplegia, monoplegia, aphasia, and amaurosis may occur with essential hypertension.

THE functional changes in the brain secondary to hypertension are indicated by headache, vertigo, fainting, and sometimes impaired memory, and even mental changes. The headache is of a distinct kind, as a rule, coming on in the morning and disappearing before noon, and is an ache confined to the back of the neck and over the back part of the head. It has long been hoped that some test could be used to determine the oncoming of cerebral accidents, but so far there is no way of obtaining this kind of information with certainty.

Taylor and Page pointed out five useful signs and symptoms which they considered evidence indicating a stroke would occur within the following two years. They were: (1) severe occipital headache, (2) vertigo or syncope, (3) motor or sensory disturbances, (4) nose bleeding, and (5) hemorrhages in the absence of choked disks.

#### BENIGN (ESSENTIAL) AND MALIGNANT HYPERTENSION

Volhard and Fahr classified essential hypertension into the benign and malignant forms. Although these terms are not quite satisfactory, they have become fairly well established in the literature. Originally these authors applied the term "malignant nephrosclerosis" to the case in which there was an inflammatory lesion added to a kidney already diseased with arteriosclerosis. In this country the term "malignant hypertension" has a different connotation, as pointed out by several authors. The patient with the benign form will develop symptoms of hypertension in the late forties or in the early fifties after having had elevation of blood pressure for from five to ten years. The benign form takes a slow, painless course and terminates in most cases in heart failure, cerebral hemorrhage, or uremia many years after the onset of hypertension. The malignant form differs from the benign in degree of severity, speed of progress, and the ultimate outcome.

In both forms, arteriosclerosis of the small arteries of the kidney and other organs is present. But in the malignant type, the arteriosclerotic process is much more widespread, and involves the smallest arteries and arterioles of the kidneys and other essential organs of the body. The characteristic histologic lesion of malignant hypertension consists of necrotic lesions scattered throughout the afferent arterioles of the kidney. The difference histologically in these two forms is one of degree, not of kind.

Clinically, malignant hypertension occurs more often in patients under the age of 50. The blood pressure, which may have followed a benign course for a few years, suddenly rises and becomes fixed at a high level. The diastolic blood pressure, which formerly was below 110 mm., cannot be reduced below 130 mm. Severe headaches are almost always present, and there is loss of appetite, loss of strength and of weight, and vomiting usually occurs. The general deterioration of health brought on by the involvement of more than one of the essential organs

of the body is the feature which prompted the use of the term "malignant" in the beginning.

The downward trend of the disease is rapid and stormy. Death usually occurs abruptly within a period ranging from a few months to a few years after the onset of the malignant phase. Clinically, the chief diagnostic feature occurs in the eyegrounds. They are characterized by choking of the disks, old and new white patches scattered throughout the retina, old and new hemorrhages both large and small, and edema of the retina, which usually obscures the constricted arterioles.

#### MANAGEMENT OF HIGH BLOOD PRESSURE

The rational method of treatment would be to remove the cause, but since the cause of hypertension is not known, treatment must be limited to palliative measures. Treatment, as a rule, is deferred until one of the chief complications sets in, since hypertension itself seldom causes any discomfort. And although it is always difficult to determine which patients are destined for early trouble and which may escape complications, it is usually best to attempt to control the excessive hypertension before complications become imminent.

The general measures and symptomatic treatment are sufficient in many instances to control a moderate high blood pressure. An inquiry into the patient's ways of life, daily habits, and diet may prove beneficial in aiding the patient. By a carefully conducted history, one may obtain information regarding the patient's personal life and help him correct any problem he may have. The blood pressure often falls to normal after the removal of some emotional factor has been effected.

Blood pressure may be reduced by recommending changes in habits, such as more rest, a nap in the afternoon, and less work and more recreation, thus lessening the load on the heart. Sometimes the patient's occupation is not suitable for a hypertensive, and it may be advisable at times for the patient to consider changing from one job associated with emotional strains to one adapted to his nature.

The patient's diet may be adjusted to the needs of the body. Most patients forget that when they are in the forties or fifties they do not metabolize food as well as they did at a younger age. Therefore, reduction in food as well as following a low protein diet containing a high alkaline ash should not be overlooked. Kempner pointed out that dietary treatment is useful in kidney disease, but is of little or no value in cases of hypertension without obvious renal involvement. For cases with this hypertensive complication, he recommends the rice diet and shows that those people who follow the diet have a urea nitrogen concentration below the level of normal as well as maintenance of hemoglobin and plasma protein levels.

Much has been said on the use of tobacco, but personal experience has shown that those patients with hypertension and beginning cardiac hypertrophy should cease smoking immediately, for they will begin to feel better and progress more satisfactorily. As for the use of alcohol, there is great diversity of opinion. Apparently, patients accustomed to the use of alcohol in moderation may continue its use, but as a general rule, those patients suffering with heart disease will do best without it.

The drug treatment of hypertension has never been highly satisfactory. However, potassium thiocyanate is of distinct value. It is very effective in many patients in controlling severe headaches, tinnitus, and vertigo. According to Bennett, no one knows exactly how this substance acts, but there is no doubt at all that potassium thiocyanate does sometimes give dramatic results in properly selected cases.

Barker was responsible for the modern use of potassium thiocyanate. He emphasizes the careful control of the blood level of the drug if adequate results are to be obtained. Usually, potassium thiocyanate is given in 3 gr. tablets two or three times a day, or often enough to maintain the blood level between 8 and 14 mg. per cent. A check on the blood concentration should be made about every ten days at least during the early months of treatment. Thereafter, determinations may be spaced at one- to two-month intervals. Thiocyanate should be

stopped during fever periods or infections. It should not be employed at all when there is renal insufficiency and in the presence of heart failure. Patients over 60 years of age must be treated cautiously because a sharp reduction in blood pressure may lead to cerebral complications. Patients with hypertensive headache have also been treated with this drug. But it should be restricted in cases in which hypertensive headache is a predominating feature.

The toxic manifestations of potassium thiocyanate have been dwelt upon at length by many. Personal experience has proved that these toxic manifestations are not as serious as claimed, since the potassium thiocyanate level of the blood is watched carefully. The patient is warned to discontinue the use of the drug when itching of the skin occurs or when a rash appears on the body. Exfoliative dermatitis may develop if the use of the drug is continued in such cases. Mental symptoms, anemia, severe exhaustion, or nausea and vomiting also require stoppage of the drug.

Xanthines, barbiturates, and nitrites have been used in treatments, but their benefits are difficult to assess. In a study by Kapernick a number of drugs commonly used in the treatment of hypertension were tested. But no sustained significant reduction in blood pressure of persistent hypertensives was brought about after a thirty-day period of treatment. Vitamin A in large doses has been recommended for treatment, but thus far the results have not been as satisfactory as expected.

WITHIN recent years the psychosomatic approach to hypertension has not been neglected. As Weiss and Kleinbart point out, this approach does not mean to study the somatic, but to study the psychic more. This form of therapy requires a very thorough understanding of the patient's environment, his living conditions, and even his inhibitions. Knowledge of a patient's anxieties and fears are not obtained by a casual interview with the patient. The consequences of high blood pressure are so serious in the minds of some that it takes

more than a bottle of medicine or pills to bring this pressure down. Neither is it enough to tell the patient to forget and that his troubles mean nothing, for if his blood pressure is high, he usually is worried. While the psychosomatic treatment is not the only measure of therapy, in some cases it is very helpful.

Sympathectomy for essential hypertension accomplishes the following results: (1) Relaxation of the vascular bed of the lower extremities and of the abdomen occurs; and (2) the blood pressure usually falls following the operation, but frequently rises again. Several kinds of operations have been recommended for hypertension, but judging from the literature, there is no unanimous opinion as to the most desirable one.

White regards the operation as a rational approach to the treatment of hypertensive heart disease until a simpler but more effective method is discovered. Kerr, on the other hand, says hypertension by itself does not often give symptoms until the subject is aware of his high blood pressure, and he is generally relieved of symptoms of anxiety after sympathectomy or any other method of treatment carrying an impact of suggestion. Kerr is far from enthusiastic over sympathectomy and says that the beneficial results are about the same as after the use of any other method employed with equal enthusiasm and diligence. He raises the question whether sympathectomy is not another example of mastery of technic over reason and whether it will not soon fall into disfavor along with sympathectomy and thyroidectomy for heart disease.

Although sympathectomy has been successful in some cases, there are several disadvantages to its use:

1. Not all patients are suitable for the operative procedure. The young or middle-aged are the best candidates (those between 30 and 45 with a relatively high diastolic (120-140) and a relatively low pulse pressure (50-77 mm.) reacting well in blood pressure levels to change in posture, to cold, etc.).

2. This operation is always a major one which demands long convalescence.

3. It is not possible beforehand, despite the elaborate measures for determining suitable patients, to say which patient will be benefited. In determining the outlook for individual patients, chief factors such as the preoperative level of the diastolic pressure, the condition of the brain, the eyegrounds, heart, and kidneys, and the response to sedation must be considered. The duration of hypertension is always important, too, but it is rarely possible to obtain exact information regarding this.

When metal clamps are constricting the renal vessels in dogs, hypertension develops. Peet believes that in hypertension in human beings there is a neurogenic clamp, and by section of the autonomic nerves to the blood vessels, this clamp is removed and prevents more abnormal constriction of arterioles.

Smithwick reports that out of 179 unselected hypertensive patients observed from one to five years, the majority were improved by sympathectomy. In 42 per cent, the diastolic blood pressure was lowered, and in 8 per cent the blood pressure was higher. He says that the effects of sympathectomy are generally as follows: (1) lowering of diastolic levels, (2) narrowing of pulse pressure, (3) reduction in ceiling levels after stimulation, and (4) reduction in the magnitude of reflex responses.

AT THE present time, there is no unanimity of opinion regarding the advisability of sympathectomy for hypertension. Most clinicians believe it is a measure too drastic and extensive for most patients with high blood pressure. If we consider the fact that the majority of hypertensives live useful lives without discomfort for many years, the group of patients which should be subjected to surgery becomes quite narrow. For the hypertensive under the age of 50 who has a progressively increasing hypertensive picture and who has the prodromata of some serious complication, this operation should be considered. But for the individual with hypertension who is not suffering from the chief symptoms, such as headache, impending heart failure, or stroke, conservative

treatment and medical measures are best.

There is a growing tendency to recommend without justification these drastic methods for hypertensives who may be able to live comfortably with little or no treatment. Most hypertensives require little treatment, some are helped by medical treatment in moderation, and a few well-selected cases may obtain benefits from sympathectomy.

#### SUMMARY

1. Although extensive research has been done in the field of hypertension, there is still much confusion, since the etiology, pathogenesis, and course are not known.

2. Some kidney diseases, such as glomerulonephritis, polycystic kidney, pyelonephritis, and tumors may cause hypertension, but the cause of essential hypertension is not known. Essential hypertension is the most common form, accounting for about 80 per cent of all cases.

3. Most patients with hypertension live comfortably for many years without any added signs or symptoms. Treatment of the benign form should be moderate and simple. In a few patients drastic measures such as sympathectomy may be used.

4. Kidney insufficiency, although considered carefully, is usually not a common complication. Cerebral accidents, on the other hand, are by no means rare and occur in about 12 to 16 per cent of cases.

5. Malignant hypertension is a later phase of the benign form and differs only in the greater severity of its symptoms, the more rapid breakdown of the essential organs of the body, and the more persistent and excessive hypertension.

6. Psychosomatic as well as drug therapy is suggested, and potassium thiocyanate is discussed for treatment.

7. Results of sympathectomy for hypertension have been gratifying in many cases, uncertain in some, and definitely poor in others. An unfavorable aspect of sympathectomy is the growing tendency to subject patients to this major operation who would progress satisfactorily with a less drastic method of treatment.

# A New Antacid for Peptic Ulcers

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PEPTIC ulcer is a disease of the twentieth century. I do not wish to imply that peptic ulcer did not exist previously, but it is only since the general use of the diagnostic x-ray that we have objective evidence of the disease in the living patient and that it can be accurately diagnosed. As late as 1935 the diagnosis of duodenal ulcer in some of our leading institutions was made by so-called "secondary signs" and was often wrong.

Only in the last ten years, with the general adoption of aimed compression serial technic as developed by von Bergmann and Akerlund in the 1920's, is the objective diagnosis of duodenal ulcer approaching perfection. This improvement in the accuracy of determining the presence of ulcer and the general acceptance by the profession of the x-ray as the *sine qua non* for ulcer diagnoses have resulted in the discovery of ulcer in a greater number of people than it was thought suffered from ulcer in the early years of the century.

With the improvement in diagnosis the judgment of therapeutic results became more discriminating. It was gradually learned that the antacids which had been used for centuries for

dyspepsia in general were much more valuable in the treatment of ulcer. Although von StrumPELL, as early as 1895, used a mixture of bismuth subcarbonate and sodium bicarbonate to treat gastric ulcer, it was Bertram Sippy of Chicago who in 1917 gave us the concept of continuous acid removal as a requisite for the healing of the much more common duodenal ulcer as well as gastric ulcer. The best available antacids in Sippy's day were sodium bicarbonate, bismuth subcarbonate, and magnesium oxide. He used the constipating bismuth salt to counteract the laxative effect of magnesium oxide. Sippy soon learned that bismuth salts were very poor antacids, and in his last years discontinued their use and replaced them with calcium carbonate. Per unit of weight, magnesium oxide is still the most active antacid we have, but it is so laxative in action and after ingestion causes such a marked secondary acid rise that it has fallen into disuse.

In the past quarter of a century several other methods of ulcer therapy have been suggested. I will mention a few: diathermy, x-ray therapy, injections of foreign protein, emetine hydrochloride mixed with foreign protein, streptococcus vaccine, the histaminic hydrochloride, the amino-acid histidine, and anterior pituitary

\*From the Presbyterian Hospital in Newark, New Jersey.

snuff. None have proved effective. Clinical experiments with urogastrone (Sandweiss) and enterogastrone (Ivy) are as yet inconclusive. However, many improvements have been made in the treatment of ulcer.

The regimen used by Sippy has been modified to advantage. He used mixtures of milk and cream. Since many patients are cream-sensitive, the use of this mixture has given way to whole milk. Puréed vegetables and other foods are used at the onset of therapy instead of milk and cream alone. Sippy starved his bleeding patients. Andreson pointed out that there was an advantage in promptly feeding bleeding ulcers.

The antacids used by Sippy had many disadvantages. Calcium carbonate was too constipating and magnesium oxide too laxative, and to strike a happy medium in the dosage of each for an individual patient was almost impossible. The sodium bicarbonate used was absorbed and caused alkalosis. Both sodium bicarbonate and calcium carbonate, when neutralized, produced carbon dioxide, which the patient belched to his embarrassment and often to the amusement of his friends and relatives. Then the introduction of tribasic salts of calcium and magnesium, of aluminum hydroxide, and phosphate jels, and of magnesium trisilicate were an improvement on the antacids used by Sippy. Unfortunately, these antacids all have constipating or laxative action upon the bowel, and in some patients the discomfort caused by this irritating effect on the intestines is more difficult to manage than the pains caused by the ulcer. The search for an ideal antacid continues.

#### NATURE AND USES OF SYNTHETIC RESINS

In 1938, while seeking an improved antacid, I discussed acid adsorbents with Mr. Howard Tiger, a water purification engineer. He had recently returned from a trip abroad on which he had investigated the report of Adams and Holmes concerning the ion exchange properties of certain synthetic plastic resins. We computed that of the resins then available about



MANFRED KRAEMER

a pound a day would have to be ingested in order to remove sufficient acid in a patient with ulcer and to promote healing.

Synthetic resins are plastic substances which have been developed in a great variety of chemical formulas since 1906, when Baekeland discovered the substance now called Bakelite. These synthetics were called resins because they had a physical resemblance to such natural resins as amber; but there is no chemical relationship between synthetic and natural resins. These synthetic resins were highly prized for their hardness and inability to react with common chemicals; it was this inert quality which made them so useful for radio panels, hair brushes, and the like. It was known that some of these resins had biologic properties since they produced a dermatitis on the hands of patients who were sensitive.

In 1935 Adams and Holmes discovered that resins of a type known as phenol formaldehyde condensates could remove acids from solutions. If passed through an alkali medium, the acids were released and the resin was restored to its

original state of usefulness. Such a substance, which lent itself to rejuvenation, immediately found extensive use in the water purification industry. Both acid- and alkali-adsorbing resins were produced. The industry developed so rapidly that now synthetic resins for removing acids and alkalies from liquids are sold on a tonnage basis.

**D**URING World War II resins of increasing acid-adsorbing power were developed. Tiger had performed animal experimentation with the earlier anion exchange resins and had proved their innocuous nature. Segal, working with one of the newer resins, showed them to be innocuous for rats and mice in doses so high as to constitute an equivalent of 20 per cent of the animal's diet over a period of many months. Martin improved on the acid-adsorbing power of the resin used by Segal. This resin had sufficient acid-removing power to suggest it useful in the treatment of peptic ulcer in dosages of 10 to 15 gm. for twenty-four hours.

Reports of its clinical efficacy have been published by Speare and Pfeiffer and myself. A more extensive experience will be published shortly. In this paper I will discuss my findings in 90 patients with duodenal ulcer treated for from one to fifteen months with resin.

The resin ion exchangers, of which these phenol formaldehyde condensation products are a group, have found wide usage in the chemical field and present possibilities in therapy other than in the treatment of peptic ulcer. Cation exchange resins should be developed to withhold sodium from adsorption through the bowel mucosa. Thus patients on low sodium diets, cardiacs, nephritics, epileptics, and the like might be given a normal amount of salt in their diet, provided they simultaneously ingested a specific amount of resin. I have discussed this possible use for resin with Mr. Tiger, but as yet no reports of animal experimentation have appeared. Until such are carried out, no clinical studies can be made. William Dock has recently called attention to the possible oral ingestion of cation exchange

resins to remove ingested sodium in cases of cardiac edema. Resins may be developed with the ability to adsorb irritating exudates from wounds. A cation exchange resin placed about an ileostomy stoma or the opening of a pancreatic fistula would adsorb the alkaline small bowel secretions and minimize skin excoriation. Since resins act in any state, no macerating solvent would be required.

The synthetic resins are also adsorbers of enzymes. Wilkinson and Martin have shown a reduction of peptic activity to 17 per cent of its original value by the addition of Amberlite IR IV to a pepsin solution. Although Segal's studies do not corroborate those of Martin, the value of this resin as an antacid in treating peptic ulcer possibly may be enhanced by its simultaneous adsorption of pepsin. This property of enzyme adsorption should make resinous preparations all the more valuable in the protection of the skin about duodenal and pancreatic fistulas also.

The synthetic resins absorb the various alkaloids and slowly release them as the *pH* of a dissolving medium changes. By combining a resin with an alkaloid one should be able to maintain a more even adsorption of various alkaloids from the digestive tract over a longer period of time than is now possible. At present a patient usually complains of dryness and blurring of vision an hour after taking atropine sulphate. This effect disappears before the next dose is given or during the night. Thus we have an inconstant action. By combining a resin with an alkaloid we might produce a constant physiologic effect over a twenty-four-hour period. Other obvious valuable combinations with alkaloids present themselves.

#### EXPERIMENTS WITH A RESINOUS ANTACID

We were generously supplied with a resinous antacid by Dr. Gustav Martin.\* This resin is a

\*Research Director, National Drug Company. The resin used in this study is now being prepared under the trade name Resinat.



phenol formaldehyde condensation product. It is called Amberlite IR IV in its crude state by the chemical trade. It polymerizes freely, and its structural formula is suggested in Figure 1. It is not known at which point the hydrochloric acid is bound.

We added the resin to a fixed amount of N/20 HCl and also added it to specimens of gastric juice obtained from patients. We compared the neutralizing power of the resin with calcium carbonate and with an aluminum hydroxide suspension in common use. On a volume basis we found that the neutralizing power of the resin was less than that of calcium carbonate but better than that of the aluminum hydroxide suspension.

The resin we used was of the 200-mesh type prepared by Dr. Martin. By further grinding, it is hoped that a finer mesh resin can be produced. The ideal resin should approach the neutralizing power of calcium carbonate. The 200-mesh resin of Martin has several times the neutralizing power of the larger mesh resin used by Segal. Further endeavor by pharmacologists should produce a finer mesh resin and further enhance the acid-adsorbing power of the material. Acid adsorption appears to be a surface phenomenon. The finer the mesh of the resin, the greater surface exposed and the more acid adsorbed.

#### DOSAGE AND METHOD OF ADMINISTRATION

I have used a set of three ulcer diets (Tables 1, 2, and 3) for the past eleven years to evaluate various antacids. These diet schedules are easier to use than the standard Sippy regimens and provide a more adequate intake and greater variety of food. Eighty per cent of our patients have been started on the Semi-Ambulant Ulcer Diet (abbreviated as S-A), while 20 per cent have been started on the Hospital Diet. These diets avoid the use of continuous drips of either milk or aluminum jels. Drips of various types, though efficacious, render the treatment of ulcer needlessly complex. In the hospital night hypersecretors are awakened by the nurse and

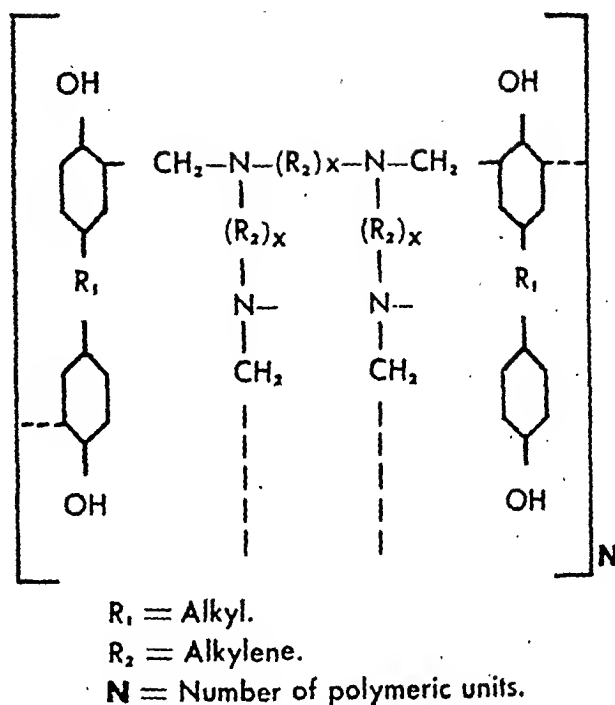


FIGURE 1

are fed milk and antacid where indicated on the schedules. The patients treated at home set their alarm clocks a half-hour before the usual time of onset of their night pain and drink some milk and take some antacid. The diets are self-explanatory and save the physician needless calls from patients or hospital attendants. Affixed to a hospital chart, they save the time required for writing orders. The antispasmodic used on these diets is prescribed as follows:

Rx	Atropine sulphate	.0003
	Phenobarbital	.015
	Milk Sugar q.s.	
	D.T.D. capsules	No. XXX
	Sig: Antispasmodic, one capsule where directed on diet schedule.	

The resin was first used in doses of 4 gm., but I have found that from 0.5 to 1 gm. is sufficient. I have been using 0.75 gm. as an average dose. Since our resin is now prepared in 0.25 gm. capsules we label the bottle: "Antacid: 3 capsules when directed on diet schedule." On the Semi-Ambulant regimen the patient will require 18 to 24 capsules a day. These diet

schedules can be used with any antacid. I have used them with either aluminum hydroxide suspensions or with magnesium trisilicate as the antacid.

**P**ATIENTS with complicated ulcers and those whose symptoms do not subside in twenty-four to forty-eight hours on the Semi-Ambulant regimen are hospitalized. In the hospital I prescribe 0.75 gm. (3 capsules) of the resin during the day and 1 gm. (4 capsules) at night whenever the antacid is indicated on the Hospital Diet. If the patients have a partial obstruction no feedings are given after 6 P.M. and the stomach is emptied with the aid of a Wangenstein apparatus at 10 P.M. No night feedings are given to these obstructed cases. If the 10 P.M. residual does not diminish to less than 50 cc. in three days, we consider the patients to be unsuitable for medical treatment. All patients are kept on the Semi-Ambulant Ulcer Diet for six weeks. Patients who are hospitalized are usually released after two weeks and are then also placed on the Semi-Ambulant diet for six weeks. After six weeks of the Semi-Ambulant regimen all patients are placed on the Diet for Quiescent Ulcer. Patients are advised that this last type of diet must be followed for many years and in cases where there are ulcers with much deformity or in cases that bleed frequently, it must be adhered to for life.

I think the adherence to such a regimen and the continued use of antacids and antispasmodics are the crux of the prevention of ulcer recurrence. If patients are willing to abide by regimen for many years, relapses rarely occur. To date, the disagreeable side effects of antacids and the nuisance of carrying liquid suspensions of aluminum hydroxide have caused patients to discontinue their use as soon as symptoms subside. The resin we have been using has up to now shown no such side effects. We have had patients taking several grams a day for fifteen months with no ill effects. During the season of the year when an ulcer tends to relapse, we advise a return to the Semi-Ambulant Diet for about six weeks.

TABLE I  
HOSPITAL DIET AND DIRECTIONS FOR COMPLICATED  
PEPTIC ULCER

STANDING ORDERS FOR NURSES	
This diet is prescribed for patients who are suffering from acute hemorrhage, from partial pyloric obstruction, gastric ulcer, and penetrating duodenal ulcers. For the first three days the patient must be kept in bed except to use the toilet. In bleeding cases a bedpan must be used. Visitors restricted. Feedings and medication must be given exactly at time ordered.	
A. M.	
7:55	Atropine Sulphate .0003 gm. Phenobarbital .015 gm.
8:00	Cooked cereal oz. 4, sugar cream 1, cream oz. 1, milk oz. 8.
9:00	Antacid
10:00	Milk oz. 8
11:00	Antacid
11:55	Atropine Sulphate .0003 gm. Phenobarbital .015 gm.
12:00	M. Puréed vegetables oz. 4 with butter, mashed potato oz. 4 with butter. Cup custard.
P. M.	
1:00	Antacid
2:00	Milk oz. 8
3:00	Antacid
4:00	Milk oz. 8
4:55	Atropine Sulphate .0003 gm. Phenobarbital .015 gm.
5:00	Puréed vegetables oz. 4 with butter, mashed potato oz. 4 with butter. Jello and Cream 1 oz.
6:00	Antacid
7:00	Milk oz. 8
8:00	Antacid
10:00	Milk oz. 8, antacid; Atropine Sulphate .0003 gm. Phenobarbital .09 gm.
12:00	Milk oz. 8 and antacid
A. M.	
3:00	Milk oz. 8 and antacid
6:00	Milk oz. 8 and antacid
Ascorbic acid tablet 100 mgm. b. i. d. by mouth. Parenteral B. Complex (Lederle) 1 cc. i.m. daily. After four days of this diet if the patient is symptom free add to diet as follows:	
8:00 A.M.	Puréed prunes oz. 4, slice toast, butter, soft boiled egg.
12:00 M.	Milk Soup oz. 4, slice toast and butter.

If the patient has no night pain the feedings after 10:00 P.M. may be discontinued after the third day.

#### CLINICAL RESULTS

**Hospitalized Patients**—We have treated 90 cases of x-ray proved duodenal ulcer and 1 case of gastric ulcer with resin. Seventeen of these patients were hospitalized. Of the hospitalized patients 6 were hospitalized because of severe hemorrhage requiring transfusions of whole blood. All these bleeding patients did very well. The one bleeding gastric ulcer was electively subjected to subtotal gastric resection because he had had repeated hemorrhages and the benignity of the ulcer could be proved neither by x-ray nor by gastroscopy. Four of the hospitalized patients had marked obstruction.

TABLE 2  
SEMI-AMBULANT ULCER DIET

During the period of this diet, which should last about six weeks, the patient must rest as much as possible. Relax, avoid arguments, and do not see too many visitors. Follow the schedule explicitly. If you must work go to bed for your evening meal and stay there. Spend your time off (Sundays, etc.) at rest. Choose from the allowed foods. Eat small meals.

SCHEDULE

A. M.	
7:55	<i>Antispasmodic</i>
8:00	1 plate of cooked, mashed prunes, passed through a collander. ½ cup of cooked cereal, (Cream of Wheat, Farina, hominy, Pablum or oatmeal). 1 soft boiled egg, 1 slice of toast and butter, milk or Kaffee Hag, or Sanka with cream.
9:00	Antacid.
10:00	Glass of milk.
11:00	Antacid.
11:55	<i>Antispasmodic</i>
12:00	M. Any milk or creamed soup unseasoned and strained. Cream cheese sandwich. White bread and butter. Purée of peas, lima beans, carrots, asparagus tips, beets, squash, spinach, or cauliflower. One-half cup of steamed or boiled rice, macaroni, spaghetti, or noodles, with butter. Small serving of mashed potatoes with butter. One slice of toast and butter. Gelatin preparations or rice, tapioca, bread or custard puddings without raisins or nuts; or stewed fruits if passed through a collander, and without syrup.
P. M.	
1:00	Antacid.
2:30	Glass of milk.
3:30	Antacid.
4:30	Glass of milk.
5:55	<i>Antispasmodic</i>
6:00	One soft boiled egg, or plain omelet, or cottage cheese with sweet cream. Puréed vegetable as at luncheon. Small baked potato without skin but with butter. Desserts as at luncheon. Toast and butter.
7:00	Antacid.
8:30	Glass of milk.
9:30	Antacid.
10:25	<i>Antispasmodic</i>
10:30	Glass of milk and antacid. Set alarm for following hours: Do not use seasoning for any of these foods. A pinch of salt may be used. Milk may be malted. You may drink tap water without ice as you wish. If any questions arise, phone the doctor.

TABLE 3

DIET FOR QUIESCENT ULCERS AND ALLIED DISORDERS

In health, the gastric juice is acid. When this acid becomes too high, it may cause distress. Physicians call this increase in acid, gastric hyperacidity. It is commonly referred to as "sour stomach." Hyperacidity may be associated with gastritis or peptic ulcer or it may aggravate these conditions if they are present. Patients who have an ulcer should, in order to prevent recurrence, follow this diet which keeps the gastric acid at a low level.

In addition to carefully adhering to the diet, you must eat slowly and at regular times and chew your food thoroughly. It is best to relax on a sofa for a half hour before and after meals. You must avoid strain, worry, and arguments, especially at meal time

and you must get at least nine hours of sleep each night. Eat your main meal at noon, spend your holidays and weekends in quiet and relaxation. Don't try to fight your illness; give in to it. Eat very small meals, leave the table a bit unsatisfied. Take food between meals and at bedtime to appease your appetite. If some of the allowed foods disagree with you, avoid them and substitute others on the list. Take your antispasmodic fifteen minutes before meals and at bedtime and your antacid twenty minutes after meals and at bedtime if prescribed.

FOODS TO BE AVOIDED

Salty, sour, spicy, sharp, uncooked and rough foods. Salted and smoked fish and meat. Sausages, bologna and salami. Corned meats. Shell-fish. Canned fish and meats, as salmon, sardines, and deviled ham. Bacon. Ham. Hors d'oeuvres. Oily fish as salmon, herring, mackerel, or shad. Meat soups. Broths. Bouillon.

Raw and dried fruits and vegetables except as mentioned in schedule. All salads, dressings and gravies. Coarse vegetables like cabbage, onion, celery, radish, cucumber and lettuce.

All condiments as pepper, mustard, vinegar, ketchup, horseradish, pickles, olives, chowchow, Worcestershire sauce.

Sharp cheeses. All nuts. Bread and cereals made from bran and whole wheat. Stale bread. Poppy seeds, caraway seeds. Very hot or very cold foods taken on an empty stomach as very hot soup, or ice cream. Soft drinks as gingerale, Coca Cola, and cream soda. Coffee. Strong tea. No smoking. No alcoholic beverages in any form.

SCHEDULE  
(Choose from following)

Antispasmodic

Breakfast:

Strained juice of one-half orange. Apple sauce. Stewed fruits, as prunes, apricots, and pears, baked apple without skin. Cooked cereals with cream or milk, and sugar. Soft boiled or poached egg. Toast, roll, or white bread and butter. Cocoa, Sanka, Kaffee Hag, or milk.

Antacid

10:30 A.M. Malted milk, fresh buttermilk, milk, weak tea with sugar and cream, graham crackers, Uneeda biscuits, or other plain crackers.

Antispasmodic

Main Meal (Preferably at Noon):

Creamed soup, (potato, tomato, spinach, asparagus, pea, corn, bean, celery, carrot) strained. Chicken or lean tender beef boiled, broiled or roasted. Do not eat the spiced outside cuts. Squab, turkey, guinea hen, sweetbread, broiled liver. Eat only tiny portions of any of these meats. Boiled or broiled white fish, bass, blue fish, sole, carp, pike, or trout. Restrict meats to only once a week and it is better to favor fish and the lighter meats like chicken. Thoroughly done puréed vegetables. Occasionally tender lettuce leaves without dressing. Boiled, mashed or baked potato. Gelatine, custard or pudding for dessert. Occasionally stewed fruits with cream avoiding the syrup and skins. Occasionally plain sponge or angel cake.

Antacid

4:00 P.M. Malted milk, fresh buttermilk, milk, weak tea with sugar and cream, graham crackers, Uneeda biscuits, or other plain crackers.

Antispasmodic

Supper or Lunch:

Fresh boiled or broiled fish, (only fish with white flesh) or oysters. Boiled or poached eggs. Cream cheese, Swiss cheese, pot cheese and sweet cream. Boiled rice or noodles or macaroni or spaghetti with butter and sugar only. Mashed, boiled, or baked potatoes. Bread and butter, toast or rolls. Gelatin dessert or pudding or occasionally plain sponge or angel cake or small portion of vanilla ice cream or stewed fruit avoiding sweet syrup. If you carry lunch take a cheese, egg or chicken sandwich.

**Antacid**

10:00 P.M. Malted milk, fresh buttermilk, milk, weak tea with sugar and cream, graham crackers, Uneda biscuits, or other plain crackers.

**Antispasmodic and antacid**

Drink water as you wish. You may drink any plain carbonated water as White Rock, Vichy, Poland Water, Kalak, Seltzer, and Saratoga Water. A small glass of diluted orange, tomato (plain) or grapefruit juice must be taken daily with a meal.

Many patients are sensitive to and made ill by milk. If this is true in your case take the tea and crackers between meals.

If any questions arise call the doctor.

given resin as an antacid while being prepared for surgery. Two other obstructed cases responded for some time to resin therapy but later they required subtotal gastric resection.

The remainder of the hospitalized cases (5) had complicated duodenal ulcers of many years' duration. Nine of the 10 cases that were not resected but were hospitalized have been free of symptoms for from one to fifteen months. Two recurrences have occurred in one patient at five and nine months. He is a watchman, works nights, and is unable to follow an ulcer regimen. Both recurrences responded to the Hospital Diet carried out at home.

**Ambulant Patients**—Of the 73 patients started on the Semi-Ambulant Diet and later placed on the Diet for Quiescent Ulcer, 67 have been symptom-free for from one to fifteen months. Two had recurrences after disregarding their diets but improved promptly on a return to a rigid regimen. One patient who was reported not to have responded originally to resin therapy but to gastric lavage responded to resin on a second trial five months later. Two patients failed to remain symptom-free either on resin or on other antacids. One patient who obtained no benefit from resin does well on an aluminum hydroxide suspension.

Seventy-seven or 85 per cent of our patients have been kept symptom-free on our ulcer regimen, using resin as the only antacid. One previously reported failure on resin therapy was found to have had a duodenal neoplasm and is excluded from present figures. He responded well temporarily to another antacid.

None of our patients have had any side effects as a result of resin therapy. Particularly noticeable is the lack of complaints regarding constipation and diarrhea and also the freedom from bloating and gas.

At present, the resin is dispensed in capsules. As is generally known, gelatine capsules themselves cause heartburn in some people. Technical difficulties have to date prevented the manufacture of compressed tablets. When this difficulty is overcome, the resin should enter into combination with the gastric acid more quickly and further improve our treatment.

**SUMMARY**

1. An antacid synthetic resin has been described.
2. Its usefulness in the treatment of peptic ulcer is discussed.
3. Diet and medication schedules for treatment of peptic ulcer are presented.
4. Synthetic antacid resins do not have any untoward effect on the digestive tract. They cause neither constipation nor diarrhea. Since they are not absorbed, they do not alter the acid base balance of the body. Since they can be cheaply produced, they should replace the antacids now in use.

# The Preparation of Photographs for Publication

A Scientific Exhibit From

S. J. McCOMB

*Photographic Division, Mayo Clinic,  
Rochester, Minnesota*

A critical appraisal of reproduction of photographs in the biologic field often reveals a serious lack of quality that all too often impairs the illustrative value of such reproduction. A medical illustration, specific and informative in nature, requires the utmost care in preparation to achieve the purpose for which it was made.

Successful reproduction depends on photographs of high quality. Faults in preparation or errors in technic lend themselves to improvement or correction rather simply in most cases. The main factors influencing improved photographic quality are: (1) accurate focus; (2) backgrounds suited to the subject material; (3) suitable lighting; (4) subordination of distracting elements; (5) elimination of non-essentials; (6) printing paper of proper contrast; (7) correct printing exposure, and (8) full development.

As this material was originally presented as an exhibit, the exhibit format will be retained in this somewhat expanded review of these factors.

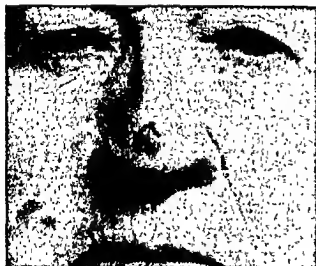
## ACCURATE FOCUS

Factual recording is basic to all biologic photographic illustration, and sharpness of focus is essential to factual recording (fig. 1). Sharpness in an illustration depends on accurate focusing and freedom from camera or subject motion. A constant complaint of editors is the receipt of fuzzy, out-of-focus pictures to illustrate an article. Such pictures, when used, actually detract from a paper because they cannot hold the attention of the reader.

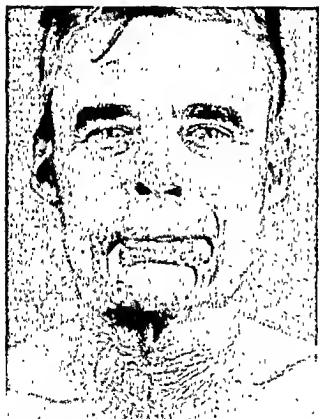
Aids to obtaining sharp focus are ground-glass focusing, a tripod for supporting the camera, and a small lens aperture to increase the depth of field. Focusing is usually done at full lens aperture and by selecting the most important aspect of the subject to be in the plane of critical focus. Stopping down the diaphragm increases the sharpness of near and far points, that is, depth of field. Far depth is greater than near depth.<sup>1</sup>

Sometimes a compromise must be effected between lens aperture and illumination, as an unduly small aperture requires a long exposure or a great intensity of light.

FIGURE 1



*Left. Lack of sharpness on point of chief interest detracts from illustrative value and fails to hold attention of the reader. Right. Good definition throughout the entire subject area makes this an interesting illustration.*



**Left**

*Lack of sharpness in photograph.*

**Right**

*Use of a small lens aperture and increased light intensity has obtained greater over-all sharpness than is present in photograph opposite.*



**Left**

*Lack of sharpness obscures the detail necessary for the interpretation of this photomicrograph. Sharpness and good definition are essential for making good photomicrographs.*

**Right**

*Sharpness and good definition in photomicrograph of same section shown opposite.*





FIGURE 2

*a. Extreme angle lighting with strong contrasts reproduces poorly. b. More even lighting results in a pleasing illustration that will reproduce well. c. An example of single flash lighting. The flashlight was directly above the lens in this instance. d. Cross light; that is, a strong side light calls attention to a defect. Sufficient general illumination was used to prevent shadows from blocking.*

While ground-glass focusing is not an essential in biologic photography, it offers enough advantages to make it almost a "must." Since the majority of photographs are made at less than normal lens-to-subject distances, very accurate focusing is necessary.

### LIGHTING

Proper lighting is second only to sharp focus as a requisite for biologic illustration (fig. 2). In simulation of natural lighting, the main light source should be from slightly above the subject so that the shadows will fall below and thus create a bit of modeling. In general, harsh lighting effects should be avoided. Balanced lighting is recommended for most clinical material. One light may be placed close to and higher than the camera, and a second light may be placed at about camera height on the other side and slightly farther from the subject. This arrangement will result in an evenly illuminated photograph with just enough modeling to show all features effectively.

Single flash lighting may be used with the light source close to the lens axis and slightly above it for even illumination of the subject.

Familiarity with basic lighting principles will soon disclose that angle or side lighting may be used to advantage for accentuated modeling, provided sufficient general illumination is used to prevent excessive contrast or blocking of shadow detail.

### BACKGROUNDS

In monochrome photography, it is essential to obtain separation of the subject from the background by tonal difference. This can be accomplished by proper choice of background (fig. 3).

In general, light subjects are best photographed with a dark background and dark subjects are best photographed with a light background, although the size at which the subject is photographed occasionally will influence the choice of a background. For example, considering only patients, a full-length view looks very well before a dark background, whereas a facial view only is best before a medium gray background.

A background of a neutral gray is very adaptable, as the intensity of light reaching it determines the tone, which can be varied from light to dark gray. In relation to a subject, simply varying the background to subject distance will achieve this. With the neutral gray background well removed from the subject, less light reaches it; as a result, the background will be darker in the finished photograph.

I have avoided the terms "black" and "white" with reference to backgrounds, particularly for patients. They are often responsible for detrimental side effects. A white background, placed close to the subject, is often responsible for a "kick back" of light on the edges of the subject, while with a black background some portions of the picture area have a tendency to blend in with the background.

### DISTRACTING ELEMENTS

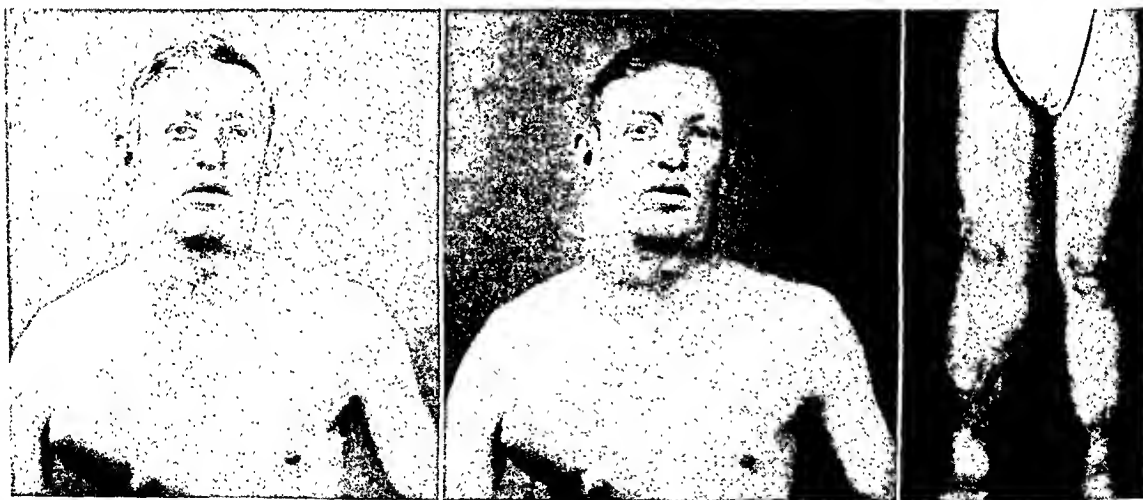
It frequently happens that distracting elements are included in a photograph either by accident or of necessity. Jewelry is particularly distracting because it causes



FIGURE 3



*Left. Displeasing appearance produced by photographing a black-haired patient before a black background. The print would suffer further loss in reproduction. Center. Same patient as shown at left, but photographed before a gray background. The over-all appearance has been greatly improved. Right. A dark lung which stands out very well against a light background.*

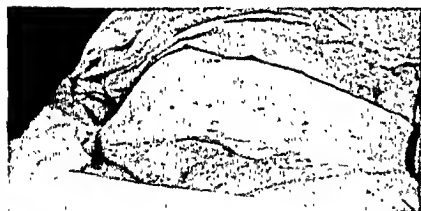


*Left. Good separation of patient from background. Center. Variation in tone of background produced by increasing the distance between the patient and the background. Right. Good general appearance but the dark areas of the skin tend to blend with the dark background. The remedy is to use a lighter background or a strong side light to produce better demarcation of the edges of the legs.*

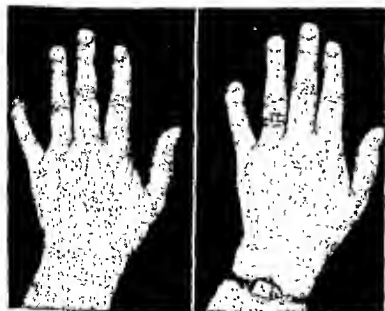
FIGURE 4



*Clothing of distracting color or pattern may be removed or a drape may be placed over the offending material.*



*Trimming the print closely often effects an improvement.*



*Jewelry is easily removed, always with benefit.*



*Careful selection of camera angle results in an improved illustration which has far greater effect.*  
(From Kent, F. W.: Medical Photography, a text book, 36 hospital, M. Radiog. and Photog.)

reflections which attract attention to themselves. Clothing of distracting color or pattern, dressings, backgrounds and even shadows are other elements that may cause trouble.

The remedy, of course, is to be aware of distracting elements at the time the photograph is made and to take care of the matter at the time (fig. 4). Jewelry may be removed, as may outer clothing. A simple draping of suitable material over the clothing may improve the illustration. Sometimes it is possible to eliminate distracting features by trimming of the print.

Dressings may be removed and the involved area cleaned. If it is not advisable to remove them completely, they may be folded back and the area draped with towels or other suitable material.

An inclusive photograph of large rooms such as laboratories or wards, often may be improved by a change of viewpoint which will minimize, if not altogether eliminate features which would prove objectionable.

### PRINTING

Technically good prints are the result of correct exposure on the proper grade of paper (fig. 5).

While correct lighting and exposure in negative making cannot be too strongly emphasized, it is the finished print that determines the quality of the reproduction.

FIGURE 5



*Lack of brilliance and low tonal range result from the use of a paper of low contrast.*



*Chalky highlights and dense shadows cause a general loss of modeling. Paper of too great a contrast was used.*

FIGURE 3 (Continued)



*A good range of tones from highlights to shadows that will reproduce well. The printing paper was suited to the negative.*



*Underexposure, usually accompanied by forced development, produces a gray, flat, weak print entirely unsuited for reproduction.*



*Overexposure results in a muddy, sometimes mottled print which has poor tone and is lacking in brilliance.*



*Proper exposure and development produce a print which has good detail throughout.*

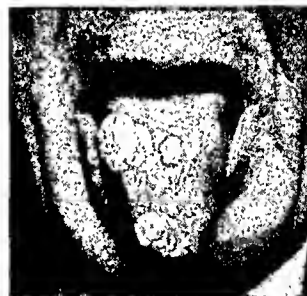
Many good illustrations suffer loss of quality by faulty technical handling in the photographic printing process.

The ideal print is one that correctly reproduces in their proper relation and depth all the variations of light and shade of the original. It is the result of the successful combination of proper exposure time on the paper best suited to the negative. Paper contrast determines the range of tones in a print and exposure time controls the density of the print. A paper that is of low contrast, that is, too soft for a negative, yields a print of short tonal range which lacks contrast and brilliance. Conversely, chalky highlights and dense shadows result from use of a paper of high contrast. It must be borne in mind that it is the full range of middle tones that reproduces best.

Exposure and development are so interrelated that one cannot be considered without the other; however, if recommended development time and temperature are adhered to, errors due to these factors can be eliminated, and only the exposure factor need be considered.

Underexposure records only the gradations in the thin portions of the negative

FIGURE 6

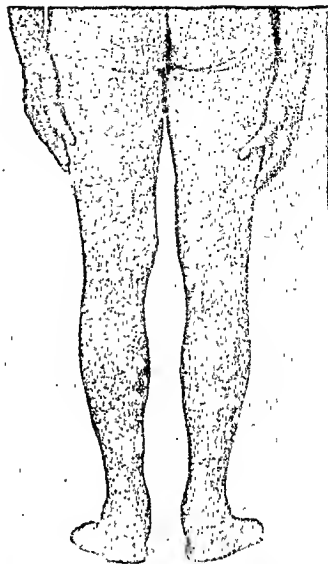


*Above. Showing the entire face in photographing a lesion of the tongue, for example, is not necessary or advisable. Upper right. Trimming to the area of interest serves to concentrate attention. Lower right. A better treatment is to enlarge the area of interest.*

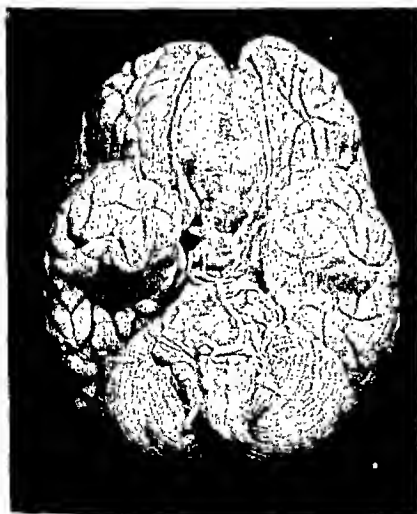
FIGURE 6 (Continued)



*This subject requires the full length but not the full width.*



*Marking the print at the borders is a good way to indicate necessary trimming.*



*Left. Trimming the sides improves the illustration.*

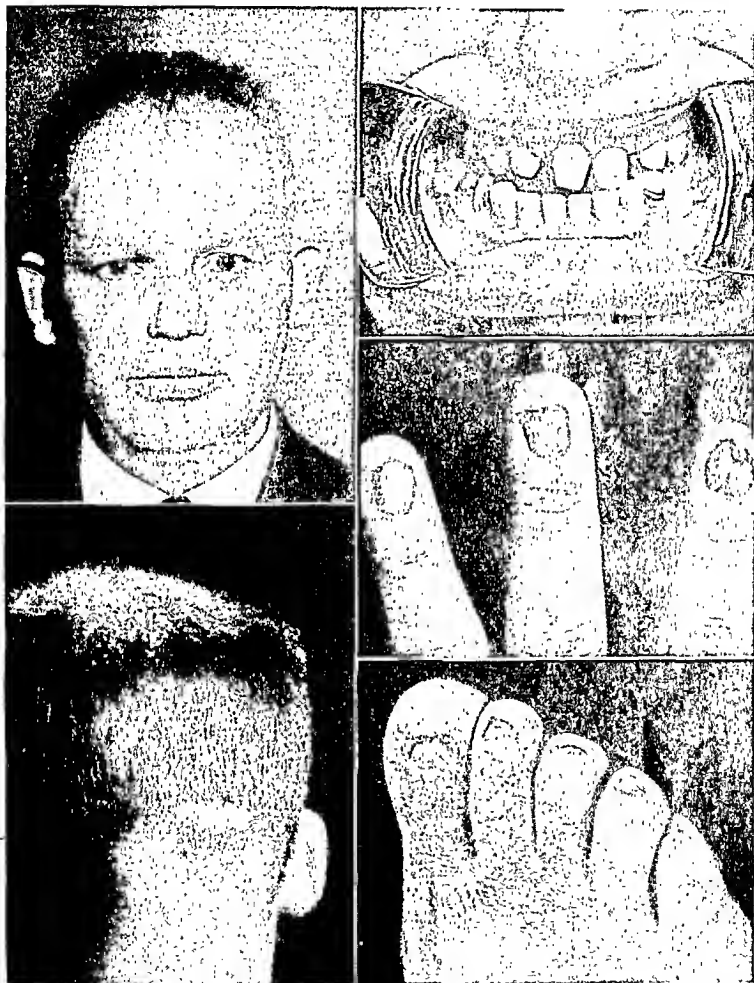
*Above. An example of rephotographing the subject close up to center attention and gain detail.*

FIGURE 7



*Contact prints simply mounted together for a layout.*

FIGURE 8



*Judicious trimming has reduced the over-all size of prints in figure 7, yet has retained the essentials of each individual picture.*



and results in a flat, weak print. If an underexposed print is forced or given prolonged development, fog results. Overexposure produces a print that has a general muddy appearance, flattened highlights and smudgy shadows with no detail. Underdevelopment does not correct overexposure. The end result of such treatment is a mottled, muddy print entirely lacking in brilliance.

### TRIMMING PRINTS

Trimming prints, like the editing of movies, is done far too infrequently. The inclusion of excessive area or unnecessary surroundings in medical photographs is one of the major complaints of editors (fig. 6).

Attention should be centered on the point of interest by including in the reproduction only that which is necessary to illustrate properly the point being made. This is done initially by proper photographic technic or subsequent enlarging, and secondarily, by proper trimming of the print.\*

In general, only sufficient surrounding area for purposes of orientation is necessary. Trimming to the essentials serves to concentrate attention and lends force to an illustration. It is similar to viewing a microscopic field at a higher magnification.

### GROUPING OF PRINTS OF RELATED MATERIAL

The grouping or combining of prints in a layout can contribute to an improved effect (figs. 7 and 8). There is economy of plate cost and economy of space. The reproduction is neater in appearance and the over-all size may be increased. There are dangers in this practice, however. The first point to consider would be to secure editorial approval of the layout principle. In arranging a layout, the proportion of the journal page must be taken into consideration for maximal utilization of the page space.

A contributing factor to over-all appearance is uniformity of backgrounds. Each unit in a layout should be properly identified as to its top, the article it accompanies and its position in the layout. It should be lettered to correspond with the legend.

An alternative method for actually mounting the prints in a layout is to indicate on a transparent overlay how the individual pictures should be placed.

### REFERENCE

1. Gibson, H. L.: *Depth of Field in Medical Photography*. *M. Radiog. and Photog.* 22:22-28, 1946.

*\*Some editors prefer to do their own trimming of prints for publication. Here again, a transparent overlay on the print, bearing suggested trimming marks, is useful; or guide marks may be placed at the EDGES ONLY to indicate the area to be used.*

# Book of the Month—A Report

## SKIN MANIFESTATIONS OF INTERNAL DISORDERS\*

**I**N THIS work, Dr. Wiener has attempted to bridge the gap between internal medicine and dermatology. Dr. Wiener is a dermatologist and his approach to the problem therefore is that of the specialist in his field. He is interested in the dermatologic aspects of internal diseases in this book, not in the related topic of visceral aspects of skin conditions. Thus the skin changes in such conditions as endocrine disturbances and infections are considered while psoriasis is not mentioned. He has obviously aimed his text at internists and related practitioners of medicine rather than writing for colleagues in his specialty.

Dr. Wiener is the dermatologist for Mt. Sinai Hospital, Deaconess Hospital, and St. Michael's Hospital, Milwaukee, Wisconsin. From the richness of his foreign references, especially German references, it is evident that he is thoroughly familiar with the European contributions to skin disease. He has drawn heavily upon his experience in German clinics for his descriptions and illustrations of dermadromes, a term coined to mean skin manifestations of internal disorders. He does not include a consideration of syphilis in his treatise and he defends this omission in his preface, explaining that this disease represents an entire division of medicine. He does however consider cutaneous tuberculosis and related dermatoses.

Included in the chapter on dermatoses with claimed but still controversial tuberculous etiology are his discussions of Boeck's Sarcoid and lupus erythematosus. This reviewer is disappointed in the sketchy consideration of the internal aspects of these diseases in spite of the fact that the topic set for this book is "Skin Manifestations." One would

expect fuller treatment for two such prime examples of diseases in which the skin and the internal organs share heavily in the division of pathology affecting them. The chief criticism of this book is



Figure 308. Lymphatic leukemic tumors. (Courtesy Dr. M. Jessnet.)

that in attempting to cover the topic the author set for himself, in important points the cover is stretched thin.

However, there is no doubt that there is much fruitful knowledge in Wiener's book for physicians whose main interest in the human body lies under the skin. There are many esoteric manifes-

\*Skin Manifestations of Internal Disorders. By Kurt Wiener, M.D., Dermatologist, Mount Sinai Hospital, Deaconess Hospital, Saint Michael's Hospital, Milwaukee, Wis. 690 pages, with 386 text illustrations and 6 color plates. C. V. Mosby Company, St. Louis, 1947. Price \$12.50.

TABLE VI. HEMORRHAGIC DISEASES  
Compiled After Quick, Haden and Other Sources

	SYMPTOMS, ESP. DERMADROMES	FUNDAMENTAL DEFECT	COAGULATION			CLOT RETRACTION TIME NORMAL 30-60 M.N.	TOURNIQUET TEST (CAPILLARY RESISTANCE)	BLEEDING TIME NORMAL 1-3 MIN.	MISCELLANEOUS
			PLATELETS (NORMAL COUNT 250-500,000)	LEE-WHITE NORMAL 5-8 MIN.	TIME				
Hemophilia	Dangerous bleeding from trauma, abscesses, etc. Bruise easily. Ecchymoses. Hemarthrosis	Hereditary failure of platelets to disintegrate and to release thromboplastin	Normal	Prolonged	Normal	Normal	Negative	Normal	Male patients. Female conductor. Very rare. Bleeding after injury delayed
Pseudohemophilia	Same as in hemophilia but milder	Hereditary failure of capillaries to contract after injury	Normal or high	Normal	Normal	Normal	Negative or slightly positive	Prolonged	Both sexes affected. Rare
Hereditary (familial) Purpura Simplex	Spontan. ecchymoses or just bruise easily		Normal	Normal	Normal	Normal	Positive	Normal	Common
Afibrinogenemia (pseudohemophilia of the German lit.)	Like hemophilia. ecchymoses	Lack of fibrinogen prob. inherited		Prolonged. Blood incoagulable		Normal		Normal	Extremely rare
Osler's Disease. Hereditary Hemorrhagic Telangiectasia	Increasing number of telangiectases which bleed easily. Cheeks, lips, ears, tongue. Dangerous recurrent epistaxis	Hereditary capillary defect	Normal	Normal	Normal	Normal	Negative	Normal	Both sexes, secondary anemia. Hepatosplenomegaly in advanced cases
Thrombocytopenic Purpura. Werthof's Dis.	Crops of petechiae and ecchymoses over whole body. Severe mucosal bleeding. Severe hemorrhage from wounds. Bruise easily (shins). Urticarial character of fresh lesions. Mucosal bleeding severe.	Failure of megakaryocytes in bone marrow to furnish enough platelets. Depressing influence of spleen	Low	Normal	Absent	Normal	Positive	Prolonged	Effect of splenectomy. Intradermal moccasin snake venom, O.I.C.C. of dilution 1/3000 elicits hemorrhagic reaction
Nonthrombocytopenic or Anaphylactoid Purpura. Schönlein's Purpura	Urticarial component of purpura. Petechiae in urticarial lesions which appear in crops, esp. over legs, face, bends of large joints; palms, soles often free	Allergy; infection	Normal	Normal	Normal	Normal	Mostly positive	Normal	Articular swelling common (purp. rheumatica)
Henoch's Purpura	Similar to Schönlein but severe gastrointestinal symptoms	Allergy; infection	Normal	Normal	Normal				Mostly fatal. Very rare
Purpura Fulminans	Hyperacute suffusions covering large areas		Normal	Normal	Normal	Normal		Normal	Fatal. Rare. Mostly small children
Waterhouse-Friederichsen Syndrome	Hyperacute petachiae and ecchymoses, coalescent to large areas	Massive adrenal hemorrhage. Meningococic infection in most cases.	Low	Normal				Normal	



Figure 337. Congested veins in carcinoma of the esophagus.

tations of disease that appear in the skin and Dr. Wiener is ingenious in discovering an amazing variety for inclusion in his work. He has included many rare diseases and tropical conditions that are not seen in this country.

In his discussion of endocrine diseases one wonders whether the author is not claiming too much for the field of skin diseases. Certainly the description of the skin changes in hyperthyroidism does not add significantly to the sum of knowledge of this disease. He writes of thyrotoxicosis: "The skin is moist, warm, and rosy but the color is unstable. The elevation of the temperature is roughly proportional to the increase in the metabolic rate. . . . The patients usually complain of excessive warmth and like to sleep with the limbs uncovered." Although what he is describing is absolutely obvious, there is a certain value in calling attention to these patent signs. It emphasizes the fact that the skin plays an important role in general diseases; that no general examination is complete without inspection of the skin.

Study of Wiener's text will direct attention of internally minded physicians to the surface of the body not primarily for the diagnosis of skin conditions but rather for appreciation of the conditions which form the title of this book.

Texts on skin lend themselves well to illustration. This book is no exception. There are six beautifully executed plates in color, and black and white illustrations on almost every page. There are also seven tables one of which is reproduced here.

### NOTICE

Applications for Part I of the examination of The American Board of Orthopedic Surgery must be received by the Secretary, Dr. Francis M. McKeever, 1136 West 6th Street, Los Angeles 14, California, *not later than January 15, 1948.*

Information relative to examining centers and dates will be announced at a later date.

THE AMERICAN BOARD OF ORTHOPEDIC SURGERY, Inc.

# MEN OF MEDICINE

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## ELLIOTT CARR CUTLER\*

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ONE of the great surgeons of our time at last has answered the summons of the Great Physician. There was a cruel want of urgency in this summons. The Angel of Death first came to notify General Cutler during the last days of the war in Europe, but he was too absorbed in his military duties to attend to any such personal business. She was reasonably patient until his work in Europe was finished; but, upon his return to the United States in August, 1945, she became so insistent that he went to his old friends in the Peter Bent Brigham Hospital for examination.

After this examination, no longer could her presence be denied or her message misunderstood. Elliott greeted her calmly, with the unfailing courtesy that characterized all of his personal relations. From that moment on, he lived with her by day and by night, never complaining of her presence, never whimpering from the pain that she intensified progressively, always resisting her impetuous demands for greater haste.

Death is one experience with which familiarity rarely breeds contempt. To face death bravely for two years, with full knowledge that there can be no escape—only a brief reprieve—requires a degree of courage with which few men are endowed. General Cutler's life has been an inspiration to many of his associates, but never was it more inspiring than during these last few months. He continued to work with zeal undiminished, and he contributed enthusiastically to plans, of which the pleasure of execution he well knew would be denied him. The intolerable pain he suffered was apparent

only in deepening lines in his face which his cheerful smile could not erase. His back bowed and his steps lagged, but never his spirit faltered. He was conquered, but he never surrendered. Old disagreements, old discords, even old enmities, gave way before this example of courage and of self-sacrifice rarely equalled; and all who knew him in these last days will remember him only with admiration and affection.

Elliott Carr Cutler was born in Maine of rugged colonial ancestry. The foundation of his character was formed of the austere virtues of the tough stock from which he sprang; but upon this forbidding rock he built a personality distinguished by kindness and loyalty to his friends. An innate honesty often compelled his professional judgments to be severe; but wherever possible, they were softened with praise of other qualities. His high ideals and his devotion to duty made him, in his younger and formative years, somewhat intolerant of mediocrity; and this occasionally brought him into conflict with others. But the years brought him the wisdom that recognizes the impossibility of universal perfection, and a tolerance for human weakness that fell short only of abridging his high principles. He required a lot of knowing, did Elliott Cutler; and casual contact rarely revealed the true fineness of his character.

His professional career was one of high distinction. Educated at Harvard, he received most of his surgical training under Harvey Cushing. As a young medical officer in World War I, his service was of a quality that earned for him the Distinguished Service Medal, an unusually high award for so young a man. In 1924, he was called to

\*Reprinted from *Military Surgeon*, October, 1947.



ELLIOTT CARR CUTLER, M.D.

*New York Times Photo*

Western Reserve University as Professor of Surgery; and, eight years later, his alma mater recalled him to succeed his famous teacher as Moseley Professor of Surgery, a position which he held until his death.

But his greatest contribution to his fellowmen was made in World War II. Shortly after Pearl Harbor he re-entered the Army, and was sent to the European Theater of Operations as the Chief Consultant in Surgery. His wisdom and his wide experience made him invaluable. His inexhaustible energy became proverbial among his fellow officers. He organized, he planned, he criticized, he praised. He was here, he was there; and he invariably subordinated his personal comfort and the prerogatives of his position to the task at hand. It was the end, not the means, that was important to Elliott Cutler, and this was one measure of his greatness. To him, more than to any other man, is due the credit for the fine medical care given the wounded in the European Theater. His tangible rewards were pitifully inadequate—elevation

to the rank of Brigadier General, and the awards of an Oak Leaf Cluster for his Distinguished Service Medal and the Bronze Star Medal. Foreign governments were pleased to honor him, and learned societies, both abroad and at home, honored themselves as well as him in conferring their distinctions. But he placed a much higher value upon the gratitude of his patients and the devotion of his young subordinates.

He gave his four sons to the service of his country. He was terribly proud of them, and rightfully so. The loss of one of them would have grieved him deeply, but he would have regarded it as not too great a sacrifice for the cause in which they fought together.

Surgeon, scholar, husband, father, American, a great gentleman has left us. He will be sorely missed, and few of us will be privileged to see his like again.

PAUL R. HAWLEY,  
*Major General, U.S.A. Ret.*

# EDITORIALS

## ETIOLOGY OF MONGOLISM

IN A sampling study of some 14,000 births occurring over a thirteen-year period in Massachusetts, Beidleman found that mongolism occurred in 3.4 per thousand live births. Projection of these figures from Massachusetts to the country as a whole suggests that there are about 7,000 mongoloid babies born each year in the United States.

Many theories of causation have been proposed. Relatively advanced age in the mother has been suggested. Recently because of studies on maternal rubella and its apparent relationship to the development of anatomic defects in the infant occurrences during fetal life have received attention.

Ingalls has recently reviewed the evidence concerning the possible effect of maternal disease on mongolism. He emphasizes the physiologic events pertinent to mongolism occurring in the sixth and ninth week of fetal life. For example, the persistence of ostium primum indicates that the septum primum and the endocardial cushion develop adequately until about the seventh week when they are arrested just short of fusion. The mystery of the association of the observed arrests of the middle phalanx of the fifth finger and those of the nasal bones with mongolism disappears, he says, when they are considered as synchronisms.

Summing up the evidence which he has been able to collect, Ingalls says that there is satisfactory teratologic evidence that the times of

origin of the developmental arrests, which characterize mongolism, synchronize at about the eighth week of gestation. Likewise, there is ample epidemiologic evidence of a significant association between maternal disease operating at about this period of gestation.

If this genetic hypothesis is correct, it would seem apparent that there is no specific maternal factor involved but that more than one of several conditions could act in the same manner during this period of gestation. In addition to rubella, a high incidence of gestational hemorrhage has been found to occur during this period among mothers of mongoloid infants. Lead poisoning and poor nutrition have been mentioned as additional causative agents. Ingalls suggests that all of them may act through affecting the oxygen supply of the fetus with temporary starvation and accumulation of toxic metabolites. The theory as proposed suggests that the causative *mechanisms* leading to mongolism operating at about the eighth week of fetal life are few in number, but that the causative *agents* are relatively numerous.

The theory proposed by Ingalls must be reconciled with other evidence such as that which relates mongolism to a high maternal age. The latter could be explained theoretically by a lessened ability of the older tissues to provide oxygen to the fetus, or by their heightened susceptibility in later years to harmful agents. Whether Ingalls' theory is correct or not, it is encouraging that active studies on mongolism are taking place with increasing frequency.

E. P. J.

## VITAMIN D IN CUTANEOUS TUBERCULOSIS

**D**URING the past five years or so, numerous European investigators have submitted evidence that vitamin D is effective in the treatment of cutaneous tuberculosis. Not too much attention has been paid these reports, because, for one thing, the disease is rather uncommon in this country. Nevertheless, the occasional case that the physician sees justifies mention of this apparently valuable therapeutic measure.

A recent issue of *The Lancet* carried a report of a symposium on the subject, which had been presented at the International Conference of Physicians in London. Nearly a dozen investigators voiced their opinions on the use of Vitamin D in cutaneous tuberculosis.

Charpy, who has been working with the technic for seven years, administers 15 mg. (60,000 units) of the drug, in alcoholic solution twice weekly for four weeks, followed by the same dose weekly for periods ranging from four months to two years. Beneficial effects should be noted by the fifteenth day. If symptoms of toxicity appear, the treatment should then be stopped.

Various other investigators reported good results with similar treatment. Dowling has treated 44 patients since early 1946, of whom 28 are now free of lupus. Lumholt of Denmark reported cures in 80 per cent of his lupus cases. Grzybowski has seen a great increase in cutaneous tuberculosis in Poland since the War. He has observed 500 new cases in six months; of 100 cases which he treated, 69 are cured or nearly so, and another 26 have shown great improvement. Other investigators, including Gitken, Ingram, and Feeny were not convinced, from their studies, that vitamin D solved the treatment problem of lupus.

Recently, Michelson and Steves, American workers, have reviewed the field and presented 6 cases of their own. Their small number of cases, as well as the short period of observation (two to five months), does not justify any far-reaching conclusions. However, they do affirm that all of their patients, 5 of whom were old

cases that had resisted other forms of therapy, have shown an initial and progressive improvement. The American investigators believe that viosterol in oil is more effective than the alcoholic solution used by Charpy. Recommended dosage is 150,000 international units daily; a quart of milk likewise is consumed every day. Toxic reactions should be watched for, although Michelson and Steves regard the dosage herein recommended as considerably less than the toxic dose; however, various authors have reported reactions of greater or less severity.

E. J.

## FOLIC ACID

**I**T now appears that folic acid (which belongs in the vitamin B group) or its chemical relations, deserves an important place in the therapeutic armamentarium for certain of the anemias. The evidence is conclusive that folic acid is helpful in macrocytic anemias of children and in sprue which may be related by reason of a common origin in a deficient dietary. Whether true or not, folic acid deserves a place in the management of these conditions.

The exact part which folic acid can play in other forms of anemia is not so certain. For example, early reports indicated that folic acid causes a rapid improvement in the blood picture of pernicious anemia. Although this observation has been confirmed, it also seems evident that folic acid does not prevent the progress of pernicious anemia as effectively as liver preparations do. Some of the patients with pernicious anemia treated with folic acid alone develop signs of spinal involvement. For this reason, it would seem highly inadvisable to attempt to treat patients with pernicious anemia with folic acid exclusively, at least until the question has been solved as to why neurologic signs develop in the face of this treatment.

Similarly, further work on folic acid in other types of anemia is needed. Thus, as is true with the introduction of almost any new therapeutic preparation, limitations and disadvantages in certain directions have been revealed, leaving behind a hard core of therapeutic usefulness.



## DIABETES

**D**IABETES is probably much more prevalent than has been commonly supposed. In 1937 the United States Public Health Service estimated that in the continental United States there were 660,000 diabetic persons, about 0.37 per cent of the population. Later estimates have been consistently higher. Marks estimates the number to be 675,000, and Joslin believes there are one million living diabetics in this country. Other writers, basing their estimates on selected groups of individuals, likewise have arrived at relatively high figures.

Recently, the United States Public Health Service made its first community study of diabetes. The object was to evaluate the various technics of case-finding, as well as to determine the prevalence of diabetes in a typical American community. Oxford, Massachusetts was the community selected; the population was 4,983,

of which 3,516 persons were studied. The study was based on case history, urine and blood sugar tests, and dextrose tolerance tests.

Seventy cases of diabetes were found, of which 30 were new cases, discovered in the course of this survey. This was a prevalence of 2.0 per cent of all persons tested. Since probably every known diabetic person in the community was represented in this group, the incidence of 2.0 per cent could not be accepted for the community as a whole. However, extrapolation of the data from the tested cases, to include the 1,400 untested persons, would yield for Oxford an incidence of 1.7 per cent. The survey revealed that for every 4 known cases, there were 3 other previously undiscovered and unsuspected cases of diabetes.

This survey points the way to better and earlier recognition of diabetes. Earlier and more adequate care means fewer complications and deaths from this disease.

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# This Month in Medicine

## INSOLUBLE PENICILLIN

THE "Romansky Formula" has been the best agent, to date, for prolonging blood levels of penicillin. Various investigators, however, have toyed with the idea of using insoluble penicillin salts to accomplish this effect.

Recently, Monash has presented data which indicate that although many insoluble penicillin salts are inactive, they are reactivated *in vivo*. As a control, Monash inoculated intramuscularly in a rabbit 20,000 units per kg. of penicillin suspended in peanut oil. No readable blood levels existed after five hours. But similar injections of silver penicillinate yielded a blood level of 0.08 units per cc. at seven hours and 0.3 units at twenty hours.

Mercury penicillinate, ferric penicillinate, as well as insoluble organic salts of penicillin likewise are reactivated *in vivo*, and yield prolonged penicillin blood levels.

### SUGGESTED READING

MONASH, S.: Use of insoluble penicillin salts for the prolongation of penicillin blood levels. *Science* 106:370 (October 17) 1947.

## MATERNAL NUTRITION AND THE INFANT

THE Fifth International Congress of Pediatrics devoted a section to "Prematurity, the Newborn, and Growth." Congenital malformations of greater or less severity were shown to be produced in rats whose mothers were fed diets deficient of riboflavin or vitamin A. Other investigators pointed out that reduced birth weights and lengths attended the period of starvation in Dutch cities during 1944 and 1945.

One of the most interesting studies was that which correlated poor maternal diet with poor physical condition of the newborn infant. A group of 216 pregnant women were studied.

The majority of stillborn infants, neonatal deaths, premature infants, and infants with major congenital defects were born to mothers whose diets were poor or very poor. Mothers on the better diets had fewer complications of pregnancy; their babies were healthier, heavier and longer, with better osseous development, and in general, with higher pediatric ratings. During the latter part of pregnancy the mother should consume at least 75 grams of protein daily.

### SUGGESTED READING

WARKANY, J., *et al.*: Congenital malformations induced in rats by maternal riboflavin deficiency. *Quart. Rev. Pediat.* 2:493 (August) 1947.

—: Congenital malformations induced in rats by maternal vitamin A deficiency. *Ibid.*

SMITH, C. A.: Wartime undernutrition in pregnancy. *Ibid.* 2:494 (August) 1947.

BERKE, B. S., *et al.*: Relation of maternal nutrition to condition of newborn infant. *Ibid.* 2:496 (August) 1947.

## JAUNDICE AND PLASMA

INDISCRIMINATE transfusion of pooled blood or blood-products involves a risk that might well outweigh the advantages of the transfusion. Many months ago, evidence was presented that pooled plasma often contains the virus of homologous serum jaundice. Among some groups of war casualties which had been treated with blood plus pooled serum or plasma, as many as 10 per cent developed homologous serum jaundice. In other groups of patients the incidence of jaundice rose to as high as 60 per cent. Deaths have been reported also.

In spite of the warnings that have been sounded, however, physicians continue to use pooled plasma, primarily because its life-saving properties are regarded as more important than the risk of infection. That great caution should be observed in the use of this material is emphasized once again in a recent article by Brightman and Korn's.

These investigators made a follow-up study of 649 patients who had received transfusions of dried pooled plasma. Homologous serum jaundice developed in 4.5 per cent of this group. During a seven-month period, at least 12 persons in upstate New York died of homologous serum jaundice. These figures probably illustrate a condition that exists throughout the country, but which as yet has not been recognized and appreciated.

#### SUGGESTED READING

EDITORIAL: Syringes, serum, and jaundice. *Brit. M. J.* 1:810 (June 9) 1945.

MAUNSELL, K.: Transmission of hepatitis during blood transfusion. *Brit. M. J.* 2:783 (December 1) 1945.

GROSSMAN, C. M., and SAWARD, E. W.: Homologous serum jaundice following the administration of commercial pooled plasma. *New England J. Med.* 234:181 (February 7) 1946.

SPURLING, N., *et al.*: The incidence, incubation period, and symptomatology of homologous serum jaundice. *Brit. M. J.* 2:409 (September 21) 1946.

SCHEINBERG, I. H., *et al.*: Homologous serum jaundice. *J.A.M.A.* 134:841 (July 5) 1947.

BRIGHTMAN, I. J., and KORN, R. F.: Homologous serum jaundice in recipients of pooled plasma. *J.A.M.A.* 135:268 (October 4) 1947.

which 51 relapsed in four months or less. Thirty-six of the 129 were not followed, but one may assume that several relapses occurred in that group, as well.

The investigators point out that various schemes of treatment employing a total of 600,000 units of penicillin administered over a period of seven and one-half days, or 1,200,000 units administered in three and three-quarters days yielded results much better than were obtained by 10,000,000 units given in one day.

#### SUGGESTED READING

BUNDESEN, H. N., *et al.*: Therapy of early syphilis with massive doses of penicillin. *Arch. Dermat. & Syph.* 56:339 (September) 1947.

### RUTIN AND ANAPHYLACTIC SHOCK

CLINICALLY, the differences between true anaphylactic shock and shock induced by histamine are scarcely recognizable. Investigators at Michael Reese Hospital, Chicago, however, have been able to differentiate the two phenomena through the use of rutin. This drug protects guinea pigs against the lethal effects of anaphylactic shock, but not against those of histamine shock. Rutin acts chiefly against capillary permeability. The investigators therefore assumed that death caused by anaphylactic shock must be brought about through some deleterious alteration in capillary permeability. The exact role of histamine in anaphylactic shock cannot be assayed; but the authors suggest that rutin might prevent the liberation of endogenous histamine.

#### SUGGESTED READING

RAIMAN, R. J. *et al.*: Effect of rutin on anaphylactic and histamine shock. *Science* 106:368 (October 17) 1947.

### ONE-DAY SYPHILIS TREATMENT

SINCE the days of Ehrlich, the physician and scientist have sought a one-day cure for syphilis. Arsenic, bismuth, fever, and various combinations of these therapeutics have been tried and found lacking. Recently, Bundesen and his associates sought to cure syphilis in one day by inoculating each of a series of patients with 10,000,000 units of penicillin.

One hundred twenty-nine patients composed the series. All revealed dark-field evidence of primary or secondary syphilis. The 10,000,000 units of penicillin were administered by intravenous drip, over a twenty-four-hour period. The experiment was a failure. At least 61 of the patients relapsed, of

### TRANSMISSION OF LEPROSY

THE mode of transmission and incubation period of leprosy are still subjects of debate. Particularly during recent years, the question has been asked as to whether leprosy can be produced

by inoculating contaminated material from a leper into the skin of an uninfected person. Several experiments, either purposeful or accidental, have been conducted, all of which have given negative or equivocal results. Consequently, a recent report of leprosy developing in two marines who had been tattooed by the same man in Melbourne, Australia, is of interest.

Both the marines and the tattooer were drunk, when the marines submitted themselves to be tattooed, in 1943. During the process, the drunken tattooer broke several needles, but apparently the marines were feeling no pain, and the operator succeeded in producing a fairly legible tattoo.

Two and one-half years later both marines developed leprosy lesions at the site of the tattooing. The leprosy was of the maculo-anesthetic or tubercloid type. Biopsy and bacteriologic examinations confirmed the diagnoses. A third marine who was tattooed by the same tattooer, but on a different day, has not, as yet, shown evidence of leprosy.

These 2 cases provide evidence of the transmissions of leprosy by inoculation.

#### SUGGESTED READING

PORRITT, R. J. and OLSEN, R. E.: Two simultaneous cases of leprosy developing in tattoos. *Am. J. Path.* 23:805 (September) 1947.

## TELLURIUM POISONING

TELLURIUM has become a most versatile component of many alloys of the baser metals. Consequently, cases of poisoning by this metal have appeared. While ordinary exposures to the dust and oxides of tellurium do not lead to serious toxic effects, when poisoning does occur it is most protracted. The most notable complaint is an obnoxious garlic-like odor of the breath and sweat, which may persist for months.

British anti-Lewisite (B.A.L.) appears to be as effective in controlling the symptoms of tellurium poisoning as it is in arsenic and mercury poisoning. One investigator injected 3 patients with B.A.L. in oil, 2.5 mg. per kilogram body weight, deep

intramuscularly into the buttock, every four hours for the first twenty-four-hour period, and every six hours for the second twenty-four-hour period. Subsequently, the men were treated on an ambulatory basis with one injection daily for six days. There were no side effects. The garlic-like odor disappeared in a week or two.

#### SUGGESTED READING

AMDIR, M. L.: Tellurium; accidental exposure and treatment with B. A. L. in oil. *Occup. Med.* 3:386 (April) 1947.

## FROSTBITE AND GANGRENE

GANGRENE which results from frostbite may be prevented by the timely administration of heparin. Recent studies reported by Lange and his associates, on experimental animals, volunteers, and on patients actually suffering from severe frostbite, have demonstrated that the heparin treatment of frostbite is based on sound rationale.

Following exposure to cold, the red cells in the exposed areas stick together and form occlusive masses. To a considerable extent, at least, this is thought to be caused by an increase in capillary permeability, leading to a rapid movement of plasma from the capillaries.

If heparin is administered within forty-eight hours after exposure, and continued for seven to nine days, the red cell masses do not form. And since gangrene is dependent upon the formation of such masses, gangrene does not occur under heparin therapy. Likewise, the plasma that escaped from the capillaries, and which ordinarily forms blisters and deposits of fibrin, is kept in a liquid and resorbable state by the heparin.

The 15 volunteers who were exposed to experimental frostbite, as well as 2 actual cases of severe exposure to cold, demonstrated that heparinization prevents the formation of gangrene.

#### SUGGESTED READING

LANGE, K., ET AL.: Frostbite: physiology, pathology and therapy. *New England J. Med.* 237:383 (September 11) 1947. R.W.C.

# Consultation Service

This special consultation information service is offered as a regular monthly feature of *Postgraduate Medicine*. Readers are invited to call on this Service for answers to difficult medical problems from members of our Editorial Board best qualified to help. Each question will be answered by mail and those of general interest will be published each month. Address all communications to Consultation Service, *Postgraduate Medicine*, 512 Essex Building, Minneapolis 2, Minnesota.

## PENICILLIN FOR RHEUMATIC FEVER

*QUESTION: May penicillin be given prophylactically to rheumatic fever patients to prevent recurrences of upper respiratory infections flares of the rheumatic fever? I have tried this with one patient using throat lozenges and he developed a painful glossitis. Was it due to the penicillin? It subsided after I stopped the penicillin but I have not tried to start again.*

*M.D.—Indiana*

**ANSWER:** The advisability of using penicillin orally for the prevention of upper respiratory infections in rheumatic fever is doubtful. In the first place, the probability of developing resistant strains of bacteria is great, and this resistance may hamper treatment if serious infections occur later. In addition to this objection there is to be considered the effect of oral penicillin on the flora of the bowel, since the production of vitamins by bacteria may be interfered with. This may be a reason for the glossitis noted. The development of allergic reactions of the mucosa to penicillin is another possibility when it is used in this manner.

## GONORRHEA PROPHYLAXIS

*QUESTION: I recently heard a comment that silver preparations were outdated as gonorrhea prophylaxis for the newborn. If so, what is used in its stead? Penicillin—if so in what strength? Does not the U. S. Public Health Service make a recommendation in regard to this matter?*

*M.D.—California*

**ANSWER:** At present health departments have not to my knowledge altered the laws enforcing the use of silver preparations as preventive measures in ophthalmia neonatorum.

However, recent work on the use of penicillin, 2,500 units per cc. in isotonic solution of sodium chloride, seems to indicate that the use of penicillin is preferable because it is more efficient and less irritating than silver preparations. See Franklin, H. C.: Prophylaxis against ophthalmia neonatorum; clinical comparison of penicillin and silver nitrate: a preliminary report. *J.A.M.A.* 134:1230-1235 (Aug. 9) 1947.

## ABSORPTION OF BEESWAX

*QUESTION: How long does the beeswax in ordinary penicillin in beeswax remain in the tissues? Does it ever provoke a foreign body reaction when used?*

*M.D.—Michigan*

**ANSWER:** Mixtures containing beeswax which have been injected subcutaneously or intramuscularly eventually have been completely absorbed in all instances thus far tested. As a rule in the preparation of such mixtures, beeswax is diluted with either peanut oil or sesame oil. This dilution tends to hasten absorption.

Microscopic examination at various intervals after the subcutaneous or intramuscular injection of mixtures of beeswax into animals has shown that the beeswax is soon broken up into small particles and that the area rapidly becomes surrounded and infiltrated with inflammatory cells and foreign-body giant cells. Suitable stains show that the phagocytic cells ingest the wax, apparently removing it from the site of injection. This is in marked contradistinction to mixtures of paraffin, against which phagocytic cells and tissue enzymes have little or no action.

After beeswax has been injected, the inflammatory process as a rule has resolved completely by the end of one month or six weeks, and by this

time no indication of the injection remains. However, in two of ninety-five instances in which quantities of beeswax up to 0.5 cc. were injected into human beings subcutaneously, a small fibrous nodule about half the size of a pea was palpable beneath the skin for some months after the injection. In general, however, formation of fibrous tissue does not take place.

## PENICILLIN FOR FURUNCULOSIS

*QUESTION: In severe furunculosis how and in what doses is penicillin employed?*

*M.D.—Illinois*

**ANSWER:** In a patient with severe furunculosis penicillin may be given in any dose desirable from 20,000 to 30,000 units every three to four hours or a single dose of 300,000 units may be injected each day for several days. In addition to this, of course, control of diabetes is one of the most important considerations as well as the possible administration of some of the sulfa drugs, preferably sulfadiazine, in a dose of 1 gm. every three or four hours for the first twenty-four hours followed by  $\frac{1}{2}$  gm. every three or four hours.

Lastly, the skin should be kept clean with frequent bathing with soap and water, followed by alcohol and local applications to some of the infected places.

## MENIERE'S DISEASE

*QUESTION: What is the proper dosage of potassium and which salts are used in the treatment of Meniere's disease? Is it necessary to limit fluid intake if salt is restricted?*

*M.D.—California*

**ANSWER:** Potassium chloride and potassium nitrate are employed in the treatment of Meniere's disease. Talbott and Brown recommend the use of a 25 per cent aqueous solution of potassium chloride. One teaspoon contains about 1 gm. of

salt and is given with water or other fluid six to eight times daily. A normal diet may be followed. Adson and Walsh recommend the use of 9 gm. of potassium nitrate (enteric coated tablets) daily for three days, then discontinued for two days, plus a low sodium diet. Ammonium chloride is also used. The treatment as outlined by Furstenberg, Lashmet and Lathrop consists of a low sodium diet and the administration of ammonium chloride, 3 gm. with each meal in capsules (six capsules each containing  $7\frac{1}{2}$  grains taken during the meal) daily for three days, then discontinued for two days. Water intake does not need to be restricted, but the excessive use of fluids is not advisable.

## REFERENCES

- BECKMAN, H.: Treatment in General Practice, ed. 5, Philadelphia, Saunders, 1945, p. 790.  
 FURSTENBERG, A. C., LASHMET, F. H., and LATHROP, F.: Meniere's symptom complex: medical treatment. *Ann. Otol., Rhin. & Laryng.* 43:1034 (Dec.) 1934.  
 TALBOTT, J. H., and BROWN, M. R.: Meniere's syndrome, acid-base constituents of the blood; treatment with potassium chloride. *J.A.M.A.* 114:125 (Jan. 13) 1940.  
 WALSH, M. N., and ADSON, A. W.: Meniere's syndrome, medical vs. surgical treatment. *J.A.M.A.* 114:130 (Jan. 13), 1940.

## AMYOTROPHIC LATERAL SCLEROSIS

*QUESTION: I am now treating a patient who is suffering from amyotrophic lateral sclerosis. I would appreciate it if you would send me any information that you may have concerning this particular illness and its treatment.*

*M.D.—Maryland*

**ANSWER:** Amyotrophic lateral sclerosis is a disease of the central nervous system of unknown causation, and up to the present no satisfactory treatment has been devised. Almost always the disease is relentlessly progressive, and terminates fatally. From a practical standpoint, it is sometimes confused with syphilitic amyotrophy. For that reason, we believe that examination of the cerebrospinal fluid in order to exclude neurosyphilis is indicated.

# What Other Editors Think

## Editorial Evaluation of Current Contributions To Medical Progress

### AUTONOMIC BLOCKADE

**I**N 1945 Acheson and Moe demonstrated that in animals the tetraethylammonium ion would block transmission of nerve impulses through autonomic ganglia. This has led to extensive investigations of the effect of this drug in man.

The drug is used in the form of the bromide or chloride and its pharmaceutical action in the experimental animal has seemed to be repeated in the tests in the human being. When administered parenterally to animals, the most prominent effect of the drug is its ganglionic blocking action. There is a rapid fall both in systolic and diastolic blood pressure which is not the result of the direct action of the drug upon the arterioles. Peripheral blood flow to the extremities is increased as demonstrated by exact skin temperature and blood flow determinations. In addition, there is dilation of the pupil, loss of accommodation, cessation of sweating, dry mouth, and postural hypotension for varying periods of time following the injection of the drug. Gastrointestinal motility is stopped and atony of the bladder is recorded as well.

The pain of angina pectoris and coronary thrombosis is obliterated following the injection of the drug in spite of a possible decrease in coronary blood flow and a definite further fall in blood pressure. Other types of visceral pain are likewise ameliorated. Clinically, Berry and his group could demonstrate no action of the drug in a sympathetomized extremity, whereas evidence of sympathetic block can be demonstrated in a normal control extremity in the same individual.

From work in the experimental animal, it seems clearly demonstrated that the site of action of the drug lies in the autonomic ganglion itself. This will produce then an "autonomic blockade" for varying periods of time.

In the presence of marked organic changes in

the blood vessel wall, as in arteriosclerosis or thrombo-angiitis obliterans, the vessel may be incapable of undergoing dilation. However, if the blood vessel is capable of vasodilation (suggesting no organic changes in the blood vessel wall) certain disease states caused by vasospasm (which refers to an abnormal degree of vasoconstriction of the blood vessels) may be diagnosed. These are manifested clinically by the signs and symptoms of coldness, hyperhidrosis, mild cyanosis and pain. The new drug has been used to establish an "autonomic blockade" thus setting up a temporary paralysis of the ganglia of the autonomic nervous system to determine whether the disease state is on the basis of permanently damaged blood vessels or whether the functional element of vasospasm is responsible, with vascular structures which are essentially normal.

The clinical use of tetraethylammonium ion for diagnostic and therapeutic autonomic blockade has been carefully worked out. It is not without danger, however. Considerable effort must be given to establishing the proper dosage for the individual patient, using progressively larger test doses. The intravenous dosage ranges from 100 mg. to a maximum of 500 mg. (1 to 5 cc.). Injection is made over a period of several minutes, with constant observation of pulse volume and the general reaction of the patient. Any untoward reactions mean discontinuance of the drug immediately. The intramuscular route is not quite as rapid and is probably a little safer in general.

In elderly patients with advanced arteriosclerosis or in labile patients with functional vascular disease lesser amounts are required to produce the desired blockade. Experience with the reaction of the patient to the injection of the drug is found most helpful in subsequent administrations. It is very rapidly excreted and no cumulative effect of the drug has been reported. Daily injections

over a considerable period of time seem to be entirely safe, one patient having had as much as 46,000 mg., used over a period of six weeks.

The value of the drug seems to fall in general into three groups. As it is now understood it is not for use over long periods of time in the hypertensive patient. This must clearly be stated—that at this stage of our present knowledge it is not the treatment for hypertension.

The drug's first usefulness seems to be in differentiating those patients who have little organic vascular disease and whose problem is largely one of vasospasm with the deranged tissue metabolism incident to chronic tissue anoxia. Hence, it aids in selecting those who are satisfactory candidates for sympathectomy as a surgical procedure. On the other hand, even though the drug demonstrates hopeless organic changes in the blood vessel walls, nevertheless a considerable subjective and even clinical relief has been reported from its use. Its last action seems to be one of giving an effective instrument for investigating the functions of the autonomic nervous system in the human body. This latter phase is in progress quite extensively and with excellent results.

*The Western Journal of Surgery, Obstetrics and Gynecology, Robert N. Rutherford, M.D., Executive Editor, p. 518, September 1947.*

## ALLERGY TO INFLUENZA VACCINES

VACCINES used for the prophylaxis of virus and rickettsial infections usually consist of suspensions of infected animal tissues in which the virus is either killed or attenuated. In recent years, techniques have been developed for the propagation of many viral and rickettsial agents in the tissues or fluid cavities of embryonated hens' eggs.

The simplest virus vaccine and the one that is now used most extensively in human beings in this country is the one containing influenza A and B viruses. Since these viruses grow abundantly in the allantoic fluid of the developed egg, this fluid is the source of the virus that is used for the vaccine.

The virus is concentrated by various methods, which involve either adsorption by and elution from embryonic erythrocytes or a similar procedure

using other adsorbing agents. Centrifugation and resuspension and, more recently, concentration and purification by means of methyl alcohol have been used in attempts to reduce the amount of egg protein in the final virus suspension. None of these methods have rendered the vaccines entirely free of such protein, however, although the last presumably removes all but an extremely small amount. Formalin is used to inactivate the viruses, and other preservatives are added before the vaccines are released for human use.

The possible effects of injections of influenza-virus vaccines in sensitizing the recipients to egg protein and in eliciting allergic reactions in children already sensitive to this protein were summarized recently by Ratner and Untracht. Studies of their own, in which such tests were done with influenza A and B vaccine in a group of 108 allergic children, were reported.

Definite sensitivity to egg white and to vaccine was found in 11 of the patients, but only 5 were regarded as "sensitive enough to warrant circumspection and caution in the use of the vaccine." It was calculated that serious egg allergenicity could be expected in about 1 in every 200 children, and probably somewhat less often in adults.

To safeguard the seriously sensitive persons, it is not sufficient to obtain a history of allergy to egg, for often this is vague. A test dose of vaccine should be given before each and every prophylactic injection, and perhaps a test should also be made with egg white. If both or either is strongly positive, the patient is seriously sensitive and vaccine should be withheld. Vaccine should be withheld unconditionally, if a systemic reaction results from the test dose.

Thirty-nine patients gave only suggestive reactions to one or more of the egg proteins. These children were mostly 8 to 13 years of age and were considered to have moderate to mild sensitivity, which at the time was probably not of clinical significance. Some of these suggestive reactors were discovered to be sensitive to formaldehyde and not to egg.

The authors expressed the belief that a history of allergy per se is of no significance, since allergic persons without specific sensitivity to egg protein are no likelier to have a reaction from the vaccine



than are nonallergic persons. Furthermore, they are of the opinion that a lack of history of this sensitivity to egg is of debatable value, as sensitivity was occasionally demonstrated in such persons by skin reactions and even by constitutional reactions to injected egg protein.

Ratner and Untracht do not mention the increased danger of reinjection in such cases, a possibility that should be seriously considered. The immunity following the injection of influenza vaccines is short-lived, and the danger of frequent reinjections must be weighed against the possible benefits. Two recent developments may help to minimize these dangers. The first has already been mentioned—the perfection of vaccines from which most of the protein has been removed. The second is the demonstration of antibody responses to single intracutaneous injections of 0.1 cc. of vaccine that are similar or superior to those resulting from single subcutaneous injections of 1 cc. of the same vaccine. Possibly intracutaneous vaccination will prove effective even with diluted virus, in which case the amount of foreign antigenic protein may be reduced still further and vaccination may then be undertaken repeatedly with safety. Only the results of a large and controlled experience will prove whether these possibilities are attainable.

*The New England Journal of Medicine*, Robert N. Nye, M.D., *Managing Editor*, Vol. 237, p. 64, 1947.

## NURSING EDUCATION

**W**HENEVER a social situation becomes pressing we may look for the advocates of nostrums and cure-alls, often more deadly than the disease. The present shortage of nurses results from various causes, among which economic factors are of major importance.

It is not surprising—though it is unfortunate—that this situation has tempted various committees of eminent surgeons and internists to rush into the breach with the happy idea that the remedy can be

found by shortening the nurses' training course and returning to the low standards which prevailed a quarter century ago.

The unfortunate thing about recent pronouncements of medical committees is their repercussions on the reputation of the medical profession itself. The prestige of the physician must rest on the respect which the public feels for the medical expert; and when the medical expert assumes the right to dictate in a field where he is not an expert, he destroys the confidence of the public in his wisdom in his own area.

Education is a highly technical problem, and the distinguished practitioner of medicine may be—and commonly is—a layman in the educational field. The subject of nursing education happens to have been explored in two exhaustive studies in which educators, nurses, hospital administrators, physicians, and public health experts cooperated. The reports of these studies have been universally accepted by all competent authorities. They rightly form the basis for our present program of nursing education. For the practitioner of medicine to ignore them is as ill-judged as it would be for a teacher to brush aside the accepted principles of medical science.

There is, however, one related aspect of the problem of nursing shortage on which the physician can, and should, make an important contribution. The training of the professional nurse is progressing along reasonably sound lines; and it has been found in all educational fields that the way to long-range increase in personnel is to raise rather than to lower standards.

There are, however, real possibilities of supplementing the work of the nursing profession by the employment of trained nursing attendants. How large the field may be for this type of subsidiary worker, and how that field should be defined, must be carefully studied. This is not a technical problem of education but a problem of administration. It should be analyzed by joint committees of health administrators and nurses in the public health field.

*American Journal of Public Health*, Vol. 37, p. 1046, August 1947.

# New Drugs

Information published in this department has been supplied by the manufacturers of the products described

## STREPTOMYCIN HYDROCHLORIDE SQUIBB

**PURPOSE:** Treatment of tularemia; all *H. Influenzae* infections; bacteremia and urinary tract infections caused by *E. coli*, *P. vulgaris*, *K. pneumoniae*, *A. aerogenes* and *Ps. aeruginosa*; bacterial meningitis caused by these organisms or by *B. paratyphosus*; dysentery caused by *Shigella* (and *Salmonella*) when resistant to sulfonamides.

**DESCRIPTION:** The dried hydrochloride salt of the antibiotic principal obtained from cultures of *Streptomyces griseus*. Potency expressed in terms of equivalent weight of the pure streptomycin base. Readily soluble in small amounts of pyrogen-free water or physiological saline solution in concentrations up to 250 mg. per cc.

**INDICATIONS FOR USE:** See Purpose.

**DOSE AND ADMINISTRATION:** Preferably intramuscularly, also intrathecally. Intravenous injection contraindicated. One to four grams a day depending upon the severity and type of infection, the patient's age, and the response.

**HOW SUPPLIED:** In two sizes of diaphragm-capped vials, containing the equivalent of 1.0 gm. or 2.0 gm. of the pure streptomycin base.

**PRODUCER:** E. R. Squibb & Sons, New York, N. Y.

## "TYROZETS"

**PURPOSE:** Prompt antibacterial treatment of throat and mouth infections.

**COMPOSITION:** Each lozenge contains tyrothricin 1 mg. and benzocaine 5 mg.

**DESCRIPTION:** Tyrothricin demonstrates prompt antibacterial effect against gram-positive organisms commonly encountered in infections of the throat and mouth. Benzocaine provides a soothing analgesic effect and quickly relieves throat irritations and discomfort.

**INDICATIONS FOR USE:** Gram-positive infections of the throat and mouth, sore throats, following tonsillectomies and surgery of throat and mouth, throat irritations, prophylactic throat protection.

**DOSEAGE:** One lozenge every three hours. Lozenge should be dissolved slowly in the mouth to insure an adequate concentration of tyrothricin in the saliva.

**HOW SUPPLIED:** Vials of 12 lozenges.

**PRODUCER:** Sharp and Dohme, Philadelphia, Pa.

## DERMESTHETIC OINTMENT—CUTTER

**PURPOSE:** Immediate and prolonged relief from the itching of poison oak, poison ivy, industrial rashes, and other pruritic conditions.

**DESCRIPTION:** It combines benzyl alcohol, phenol and benzocaine to obtain triple-action anesthetic control of itching. Being greaseless, it can be removed easily and will not stain the skin or clothes.

**INDICATIONS FOR USE:** It is particularly valuable in retarding the spread of grease-soluble irritants, such as rhustoxins and oil-soluble industrial materials, which in dissolving tend to spread and increase the area of the rash. In addition to its anesthetic effect, Dermesthetic Ointment is bacteriostatic, reducing the danger of secondary infection.

**PRODUCER:** Cutter Laboratories, Berkeley 1, Calif.

## THROMBIN, 1,000 UNITS, STERILE

**PURPOSE:** Blood coagulant.

**DESCRIPTION:** Thrombin is the natural blood clotting agent obtained from bovine blood as a sterile water-soluble white powder. Each vial contains:

Thrombin . . . . . 1,000 Units

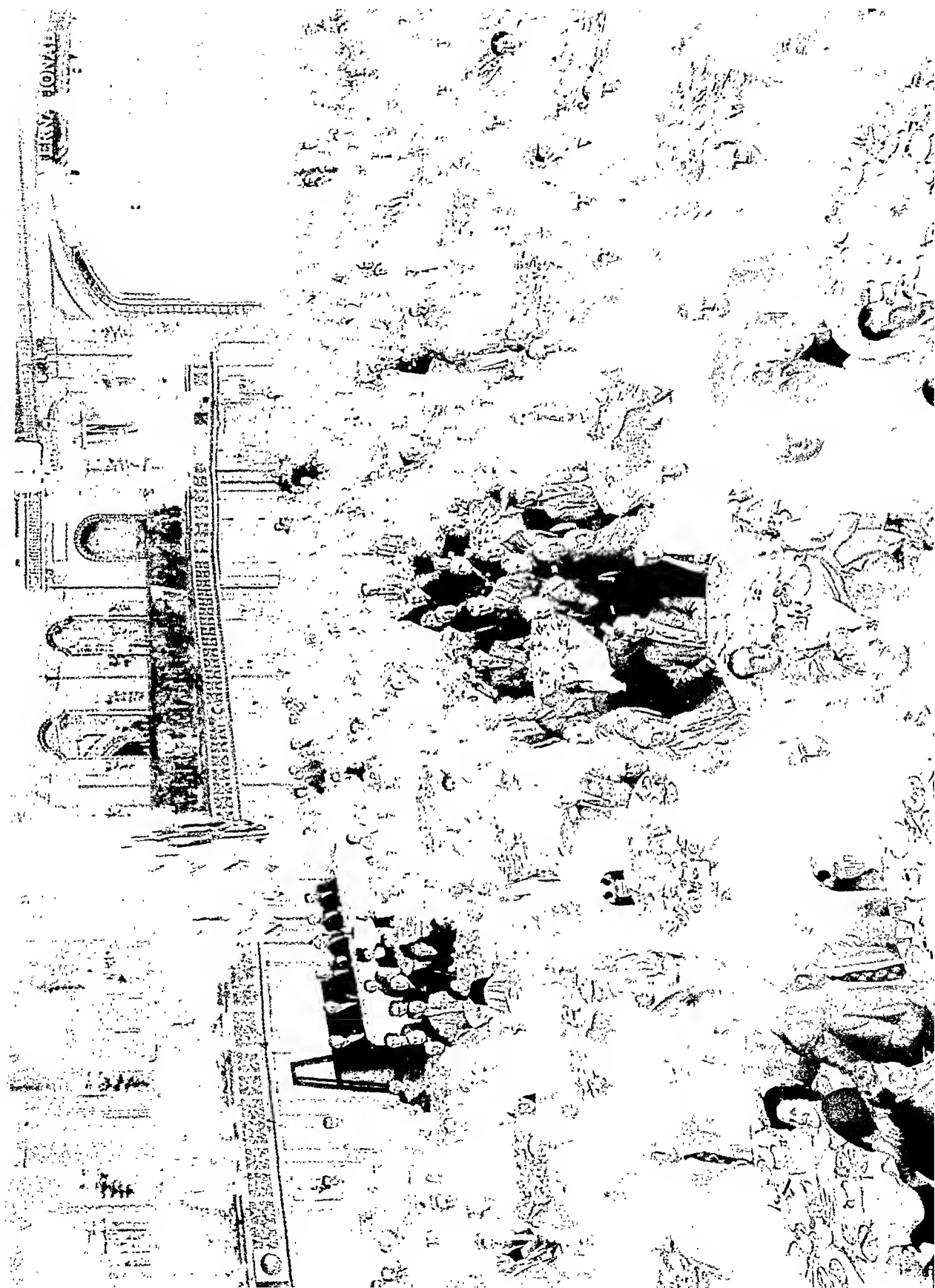
**INDICATIONS FOR USE:** In inducing clot formation and thus controlling hemorrhage from small vascular structures to which ligatures and clamps cannot be applied.

**ADMINISTRATION:** Solutions of thrombin supplying 75 to 100 or more units per cc. are prepared by adding the calculated amount of sterile isotonic solution of sodium chloride or sterile distilled water to the dry sterile powder. These solutions may be applied direct to the bleeding surface. To secure hemostasis in brain tissue, meninges, or cut surface of any viscera, fibrin foam sponges or gelfoam (absorbable gelatin sponge) may be used to hold larger amounts of thrombin solution.

**CAUTION:** Thrombin solutions may not be injected.

**HOW SUPPLIED:** 30 cc. vial. \$1.00.

**PRODUCER:** The Upjohn Company, Kalamazoo 99, Mich.



## Association Notes

Having a presidential get-together at the Assembly dinner of the 1947 meeting of the Interstate Postgraduate Medical Association in St. Louis are (from left): Dr. Carl F. Vohs, head of the St. Louis Medical Society and chairman of the St. Louis committee for the meeting; Dr. Herman L. Kretschmer, president of the Association, and Dr. James E. Paullin, retiring president.



*Photo, Courtesy St. Louis Globe-Democrat*



Dr. Edward L. Bortz (center), one of the speakers at the 1947 Assembly of the Interstate Postgraduate Medical Association, is shown with Dr. James E. Paullin (left), and Dr. Arthur G. Sullivan, managing director of the Association.

*Photo, Courtesy St. Louis Star-Times*

FRANK G. SLAUGHTER, M.D.

*A Biographical Sketch*



*New conductor of "After Hours"*

Dr. Frank G. Slaughter of Jacksonville, Florida, who takes over with this issue the column, AFTER HOURS, grew up on a farm in North Carolina and was graduated from Duke University at the age of 18, having become a member of Phi Beta Kappa at 17. He graduated from Johns Hopkins Medical School in 1930, "with no distinction except learning

a new off-color joke every day for four years." From 1930-34 he was a member of the house staff at Jefferson Hospital, Roanoke, Virginia and was resident from 1932-34. He married Jane Mundy, a Roanoke nurse, in 1933; they have two children, Frank, Jr., 7, and Randy, 4.

In 1934 he moved to Jacksonville and became a member of the surgical staff of the Riverside Hospital, a group clinic. He became a Fellow of the American College of Surgeons in 1938 and was certified by the American Board of Surgery in 1940.

Entering active duty in the Army in July, 1942, as a major, he served three years at Camp Kilmer, New Jersey, in charge of surgery, sitting on disposition boards, and directing the activities of a debarkation hospital. Assigned as Commanding Officer of the U.S. Army Hospital Ship, Emily H. M. Weder in September, 1945, he was subsequently made Chief of the Surgical Service at the Station Hospital, Los Angeles Port of Embarkation when the ship was decommissioned. He was promoted to Lieutenant Colonel in March, 1944, and was discharged in March, 1946. He did not return to medical practice after his discharge.

Beginning to write fiction as a hobby in 1935, Dr. Slaughter sold \$12 worth of his work in the first six years. His first novel, THAT NONE SHOULD DIE, was published in 1941 and was quite successful. It has been a best seller in England, Denmark, Norway and Sweden and is currently selling in France, Switzerland, Holland and Germany. There followed SPENCER BRADE, M.D., AIR SURGEON, BATTLE SURGEON, A TOUCH OF GLORY, and last year's national best seller, IN A DARK GARDEN. His latest novel, THE GOLDEN ISLE, is rapidly achieving a best seller status.

In 1946 he published a popular book on surgical progress, THE NEW SCIENCE OF SURGERY, and another on psychosomatic medicine, MEDICINE FOR MODERNS, has just appeared.

## AFTER HOURS

By FRANK G. SLAUGHTER, M.D.

"The times are ominous indeed,  
When quack to quack cries,  
'Purge and bleed.'"

SO WROTE William Cobbet of Benjamin Rush's vigorous treatment of yellow fever during the terrible eighteenth-century epidemic in Philadelphia. Rush, although temporarily routed by the newspaperman's attack, lashed back at Cobbet in the newspapers, in accordance with the custom of the times, and finally prosecuted him successfully for slander. A great hand himself with invective, Rush used many noms de plume, fairly deluging the newspapers with letters and the public with tracts urging his treatment and belaboring those who dared oppose him. So great was his influence from this and other reasons that Flexner wrote (*Doctors on Horseback*):

*Until the middle of the nineteenth century most men who died on the North American continent had little Rushes standing by their bedside with lancets in one hand and vials of calomel in another. For their master taught heroic remedies. Nature was a devil to be kept out of the sickroom by a doctor who battled every symptom with a flaming sword.*

BENJAMIN RUSH was also a master of public relations, with which we are very much concerned today, even though our methods must, perforce, be somewhat different. Sadly we must admit that medical practice is no longer as exciting as it used to be. Boredly dispensing sulfadiazine, penicillin, and streptomycin, endlessly removing the appendix, gallbladder, and uterus, who

among us does not long for the old days when medicine was indeed heroic and public relations were something one could set one's teeth into. Perhaps we shall never again know the joy of girding up our loins, taking scalpel in hand, and supported by the mite Mercury, riding forth to joust with death. Nor may we any more, disagreeing with our colleagues as to the respective values of stump water and dried snakeskins, violently lay hands upon our pens and exorcise these demons from the profession with vitriolic words, perhaps smiting them, as Cobbet did the followers of Rush, with the epithet of "clyster-pipe Dicks," or again telling sly little stories such as:



*The Frenchman taught his horse to live without food, but just as his education was completed, the poor thing died. So it is with the patients of the bleeders; by degrees they accustom themselves to live without blood, but the moment the process is completed, they expire.*

Medicine has indeed fallen upon evil days when such pleasures are denied us.

BENJAMIN RUSH not only pointed the way in public relations, he antedated by some hundred and seventy-five years the present fad of psychosomatic medicine. William Cullen of Edinburgh had already departed from the teachings of the master, Boerhave, and devised a system of his own. "Cullen contended," Flexner writes, "that a physician should control his observations by his theory (thus antedating considerably Russian propaganda methods), for the mind is a more noble instrument than the eye. He demonstrated that . . . all diseases were due to disorders of the nerve force; even gout was a neurosis." Rush went him one better and established only one disease and one source. Could this be the Libido of the psychosomatists?

BUT SUCH PRECEDENCE of theory over observation was dangerous, even for Rush, as is illustrated by a passage quoted by C. K. Drinker from Rush's "Experiments and Observations on the Mineral Waters of Philadelphia, Abingdon, and Bristol, Pa." When read before the American Philosophical Society in 1773, Rush described a medicine spring in

Philadelphia, which he recommended very highly, as follows:

*This water is found in a well, twenty-six feet deep, in Sixth Street near the corner of Chestnut Street, on a lot of ground belonging to John Lawrence, Esq. The water, when it first comes from the pump, has a slightly faetid smell, is somewhat turbid, and after standing a few hours exposed to the air, deposits a yellow sediment. The smell of the water is increased by rest. It has a strong ferruginous taste.*

One of the later owners of the pamphlet added this satirical margin note:

*The water lost its virtue within a few months after investigation owing to the contents of a neighboring necessary (privy). The well being exhausted on account of the quantity drunk, it was found the well communicated with the necessary which gave the smell and sediment.*

Life was truly exciting in those days, one of the hazards being drowning by falling in cesspools, several cases of which were reported.



WE HAVE A LOT TO LEARN, though, from Rush and the followers of the supercharged Libido, for both preach the danger of bottled-up emotions, and Rush showed the value of releasing them in words and with the pen. The disciples of Mind-and-Body tell us that the high incidence of ulcer and coronary disease among physicians results from the poor outlets for emotions provided by modern living and medical practice. Maybe it would help us to hark back to some of the customs of our medical forbears, who poured out their scorn freely upon the heads of luckless brethren, instead of muttering darkly in our beards at medical meetings and over the lunch table. And what better solace for injured self-respect than advertising our willingness to cure all comers for the small price of fifty cents a visit? We might live to a ripe old age and, spooning pop to toothless gums, gripping our wheelchairs with palsied hands, already, alas, beyond help of testosterone or wimpus, spend our years serenely cackling, "Those were the good old days." Truly an inviting prospect.

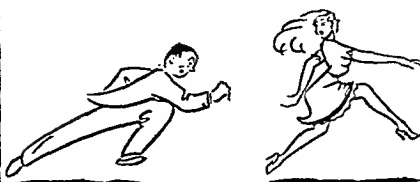
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## AFTER HOURS CONTINUED

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MAYBE YOU HAVEN'T HEARD DEPARTMENT . . . About the aging Lothario who was courting a beautiful chorus girl. The chorine, feeling that she should be on the up and up with the old boy (this part doesn't make sense but that's the way it was told to us), warned him that her heart belonged to another. "That's all right," the oldster replied, "I never aspired *that high*."

*Or the man who had female trouble; he was married to a nagging wife. And also ament the institution of marriage, a philosophical friend of ours says, "You aren't*



*married to a woman more than six weeks before she thinks she's as good as you are."*

SPEAKING OF . . . the Male Hormone, perhaps you've noticed that the pharmaceutical companies have now lowered prices on testosterone some twenty per cent. Any day now we can expect to see the startling news:

*"Now you can be a fifth more potent for the same price." What other staff (how did that phallic symbol*

*creep in here?) of life is now twenty per cent cheaper? Is this a symbol of a new era? Are prices finally beginning to fall? We think not. It can only mean, according to the well known laws of supply and demand, that the need for this panacea for human frailties has decreased. Ergo, human potency is increasing. Oh glorious thought! Oh happy prospect! Now millions of males, imbued with new life, can gird up their loins and set off in search of "Modern Woman; The Lost Sex."*

And finding her . . . Egad! We're off to the corner drugstore for some hormone pills and then the chase. . . . Twenty per cent more! . . . Yoicks! Yoicks! . . . Tallyho-o-o-o!

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# INTERNATIONAL ASSEMBLY

Cleveland Auditorium

Cleveland, Ohio

November 9 to 12, inclusive, 1948

Thirty-third Year

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## POSTGRADUATE COURSES

*Complete information may be obtained by writing directly to the Institutions offering the courses.*

*Selected Postgraduate Continuation Courses for Practicing Physicians—Beginning January and February, 1948*

### ALLERGY

<i>Institution</i>	<i>Title of Course</i>	<i>Schedule of Course</i>	<i>Registration Fee and/or Tuition</i>
New York Postgraduate Medical School, 303 E. 20th St., New York 3	Allergy	Jan. 9—Feb. 27, part time	\$ 25.00
Columbia University, 630 West 168th St., New York 32 At: Mount Sinai Hospital	Allergy	Feb. 17-25. M. through S., mornings	40.00

### ANESTHESIOLOGY

New York Medical College, 5th Ave. at 106th St., New York	Clinical Anesthesiology	Three months, arranged, full time	200.00
Tufts College Medical School, 30 Ben- net St., Boston 4, Mass.	Anesthesiology II	One month, arranged	60.00
New York University College of Medi- cine, 477 1st Ave., New York 16	Regional Anesthesia	Jan 5, intensive course, 2 weeks	200.00
	Anesthesiology	Six months, arranged	500.00

### CARDIOVASCULAR DISEASES

New York Postgraduate Medical School, 303 E. 20th St., New York 3	Peripheral Vascular Diseases	Jan. 6—Feb. 24, Part time	30.00
Columbia University, 630 West 168th St., New York 32 At: Mount Sinai Hospital	Cardiovascular Diseases	Feb. 13—March 29 Afternoon sessions	110.00
	Bedside clinics in Heart Disease	Feb. 16—March 29, part time	30.00
	Advanced Cardiology	Jan. 27—June 28, part time	250.00
At: Montefiore Hospital			
New York Medical College, 5th Ave. at 106th St., New York.	Peripheral Vascular Disease	Two months, arranged, part time	200.00

### CHEST DISEASES

New York Postgraduate Medical School, 303 E. 20th St., New York 3	Acute and Chronic Diseases of the Chest	Jan. 8—Feb. 26, part time	45.00
Columbia University, 630 West 168th St., New York 32 At: Montefiore Hospital	Diseases of the Chest	Jan. 2—May 14, part time	60.00
	Physiologic Therapy in Respiratory Diseases	Jan. 26-31, part time	40.00
New York Medical College, 5th Ave. at 106th St., New York	Pulmonary Tuberculosis	One month, arranged	150.00



## POSTGRADUATE COURSES

*Selected Postgraduate Continuation Courses for Practicing Physicians—Beginning January and February, 1948*

### DERMATOLOGY AND SYPHILOLOGY

<i>Institution</i>	<i>Title of Course</i>	<i>Schedule of Course</i>	<i>Registration Fee and/or Tuition</i>
New York Postgraduate Medical School, 303 E. 20th St., New York 3	Training for Specialization in Dermatology and Syphilology	Three years, full time	800.00
University of Southern California School of Medicine, 1200 N. State St., Los Angeles 33	Dermatology and Syphilology	Jan., 12 weeks, part time	50.00
New York University College of Medi- cine, 477 1st Ave., New York 16 At: Beth Israel Hospital	Dermatology	Jan., one month, part time	30.00

### DIABETES

New York Postgraduate Medical School, 303 E. 20th St., New York 3	Diabetes Mellitus, Nephritis and Hypertension	Jan. 8—Feb. 26, part time	45.00
Columbia University, 630 W. 168th St., New York 32 At: Mount Sinai Hospital	Diseases of Metabolism	Feb. 26—March 9, part time	40.00

### ELECTROCARDIOGRAPHY

Tufts College Medical School, 30 Ben- net St., Boston 11, Mass.	Electrocardiography II	Jan. 12-14, full time	25.00
Columbia University, 630 W. 168th St., New York 32 At: Mount Sinai Hospital	Elementary Electrocardiography	Jan. 26-31, part time	60.00
	Electrocardiography	Twelve weeks, winter, part time	40.00
New York University College of Medi- cine, 477 1st Ave., New York 16	Practical Electrocardiography for the practicing physician	One week, winter, part time	65.00

### ENDOCRINOLOGY

New York Postgraduate Medical School, 303 E. 20th St., New York 3	Diseases of the Thyroid and other Endocrine Glands	Jan. 9—Feb. 27, part time	45.00
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### ENDOSCOPY

New York Postgraduate Medical School, 303 E. 20th St., New York 3	Cystoscopy and Endoscopy	Jan. 5—Feb. 16, 15 sessions of two hours each	75.00
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### GASTROENTEROLOGY

New York Postgraduate Medical School, 303 E. 20th St., New York 3	Gastroenterology	Jan. 7—Feb. 25, part time	45.00
University of Southern California School of Medicine, 1200 N. State St., Los Angeles 33	Advanced Gastroenterology	Jan. 7, twelve weeks, part time	50.00
Columbia University, 630 West 168th St., New York 32 At: Mount Sinai Hospital	Gastrointestinal Diseases	Feb. 2—March 10	80.00
At: Columbia Presbyterian Medical Center	Gastrosocopy	Three afternoons weekly for two consecutive months. (Open to physicians experienced in gas- troenterology or surgery of the gastrointestinal tract)	250.00
New York University College of Medi- cine, 477 1st Ave., New York 16	Gastroenterology	Seven weeks, winter, part time	60.00
	Gastroenterology	Eight weeks, winter, part time	65.00
New York Medical College, 5th Ave. at 106th St., New York	Gastrosocopy	Two weeks, arranged	200.00

## POSTGRADUATE COURSES

*Selected Postgraduate Continuation Courses for Practicing Physicians—Beginning January and February, 1948*

### HEMATOLOGY

<i>Institution</i>	<i>Title of Course</i>	<i>Schedule of Course</i>	<i>Registration Fee and/or Tuition</i>
New York Postgraduate Medical School, 303 E. 20th St., New York 3	Clinical Hematology	Jan. 7—Feb. 25, part time	30.00
University of Southern California School of Medicine, 1200 N. State St., Los Angeles 33	Hematology	Jan. 5, twelve weeks, part time	50.00
Columbia University, 630 W. 168th St., New York 32 At: Mount Sinai Hospital	Hematology	Feb. 26—April 3.	65.00
New York University College of Medicine, 477 1st Ave., New York 16	Hematology	Winter, part time	50.00

### MEDICINE, GENERAL

Tufts College Medical School, 30 Bennett St., Boston 11, Mass.	Review of Basic Sciences	Jan. 5—Feb. 28	200.00
	Clinical Medicine	Jan. 5-31—Feb. 2-28, mornings	60.00
	Internal Medicine	Three months	per month 250.00
		Six months	500.00
		Nine months	750.00
Columbia University, 630 West 168th St., New York 32 At: Mount Sinai Hospital	Symposium on Internal Medicine	Feb. 2—April 3, full time	350.00
	Diseases of the Liver	Feb. 2-11	35
New York University College of Medicine, 477 1st Ave., New York 16	Internal Medicine	Three to twelve months, full time	600.00 for 12 months
New York Medical College, 5th Ave. at 106th St., New York	Internal Medicine	Full time	
		One month	150.00
		Two months	300.00
New York Postgraduate Medical School, 303 E. 20th St., New York 3	Seminar in Internal Medicine	Jan. 5—Feb. 27	300.00
	Psychological Aspects of Internal Medicine	Jan. 9—Feb. 27, part time	25.00
University of Southern California School of Medicine, 1200 N. State St., Los Angeles 33	Clinical Review of Internal Medicine	Jan. 5, twelve weeks, full time	250.00
	Internal Medicine	Jan. 5, nine months, full time	750.00
	Recent Advances in Diagnosis and Treatment	Jan., twelve weeks, part time	50.00
	Recent Advances in Internal Medicine	Jan., twelve weeks, part time	50.00

### NEUROLOGY AND PSYCHIATRY

University of Southern California School of Medicine, 1200 N. State St., Los Angeles 33	Psychosomatic Medicine	Jan., twelve weeks, part time	50.00
Tufts College Medical School, 30 Bennett St., Boston 11, Mass.	Psychiatry	One or two months, arranged	100.00
New York Medical College, 5th Ave. at 106th St., New York	Neurology	One month, arranged, full time	200.00

## POSTGRADUATE COURSES

*Selected Postgraduate Continuation Courses for Practicing Physicians—Beginning January and February, 1948*

### OBSTETRICS AND GYNECOLOGY

<i>Institution</i>	<i>Title of Course</i>	<i>Schedule of Course</i>	<i>Registration Fee and/or Tuition</i>
Columbia University, 630 West 168th St., New York 32 At: Margaret Hague Maternity Hospital	Obstetrics, Internship Training	Three months, full time	350.00
	Obstetrics, Observation Course	One month, full time	100.00
New York University College of Medicine, 477 1st Ave., New York 16	Obstetrics and Gynecology	Three months to a year, arranged, full time	600.00 for 12 months
University of Maryland School of Medicine, Lombard and Greene St., Baltimore	Gynecology and Obstetrics "A"	Review for the general practitioner, twelve weeks, full time	150.00
	Gynecology, Orcology and Female Urology "B"	Ten weeks, full time	125.00

### OPHTHALMOLOGY

Columbia University, 630 West 168th St., New York 32 At: Montefiore Hospital	Elementary Ophthalmoscopy	Jan. 5—March 1, part time	30.00
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### OTOLARYNGOLOGY

University of Southern California School of Medicine, 1200 N. State St., Los Angeles 33	Otolaryngology	Feb., twelve weeks, full time	250.00
New York Medical College, 5th Ave. at 106th St., New York	Otolaryngology Procedures	One month, arranged	100.00

### OTOLOGY

Northwestern University School of Medicine, Chicago 11, Illinois At: Ward Memorial Bldg.	Audiology and End-aural Otologic Surgery	Jan.—April, four weeks	500.00
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### PATHOLOGY

Columbia University, 630 West 168th St., New York 32	Surgical Pathology	Jan. 24—May 1, part time	100.00
University of Maryland School of Medicine, Lombard and Greene St., Baltimore	Pathology "A"	Full time, 1 to 3 or more years	300.00
	Pathology "B"	Full time, 6 months minimum	150.00
	Pathology "C"	Full time, 6 months (designed to aid in meeting the requirements of the specialty boards in neurological sciences)	200.00 plus \$10 lab fee

## POSTGRADUATE COURSES

*Selected Postgraduate Continuation Courses for Practicing Physicians—Beginning January and February, 1948*

### PEDIATRICS

<i>Institution</i>	<i>Title of Course</i>	<i>Schedule of Course</i>	<i>Registration Fee and/or Tuition</i>
New York Postgraduate Medical School, 303 E. 20th St., New York 3	Clinical Pediatrics	Jan. 5-31	150.00
	Practical Clinical Pediatrics (Open to those who have had the first course)	Feb. 2-28	125.00
	Symposium on Recent Advances in Pediatrics	Feb. 9-14	60.00
Tufts College Medical School, 30 Bennett St., Boston 11, Mass.	Clinical Pediatrics	Jan. 5-31	60.00
Columbia University, 630 West 168th St., New York 32 At: Mount Sinai Hospital	Clinical Pediatrics	Feb. 3—April 15, part time	80.00
New York University College of Medicine, 477 1st Ave., New York 16	Pediatrics	Eight weeks, winter, part time	50.00
New York Medical College, 5th Ave. at 106th St., New York	Clinical Pediatrics	Arranged	
		One month	150.00
		Three months	250.00
		Six months	450.00
		Nine months	650.00

### PROCTOLOGY

Tufts College Medical School, 30 Bennett St., Boston 11, Mass.	Proctology III	Jan. 5-31 and Feb. 2-28, mornings	100.00 each period
New York University College of Medicine, 477 1st Ave., New York 16	Proctology	Eight weeks, winter, part time	125.00

### RADIOLOGY

American College of Radiology, 20 North Wacker Drive, Chicago 6	Radiology	One week at various cities throughout the year	50.00
Columbia University, 630 West 168th St., New York 32 At: Columbia Presbyterian Medical Center	Radiology	Feb. 25—April 23, part time	25.00
New York Medical College, 5th Ave. at 106th St., New York	Diagnostic Roentgenology	Arranged	150.00
	Radium and Roentgen Therapy	Arranged	150.00

### VENEREAL DISEASES

University of Southern California School of Medicine, 1200 N. State St., Los Angeles 33	Modern Treatment of Syphilis	Jan. 8, twelve weeks, part time	
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